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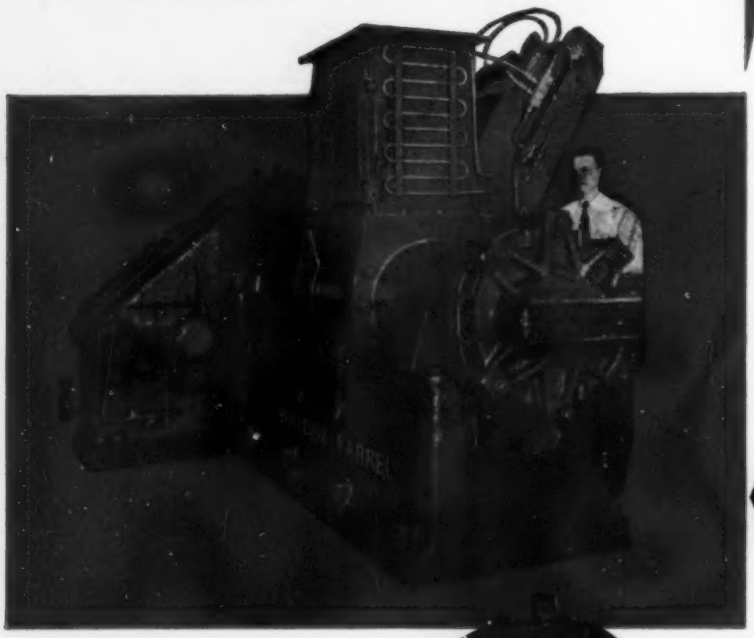

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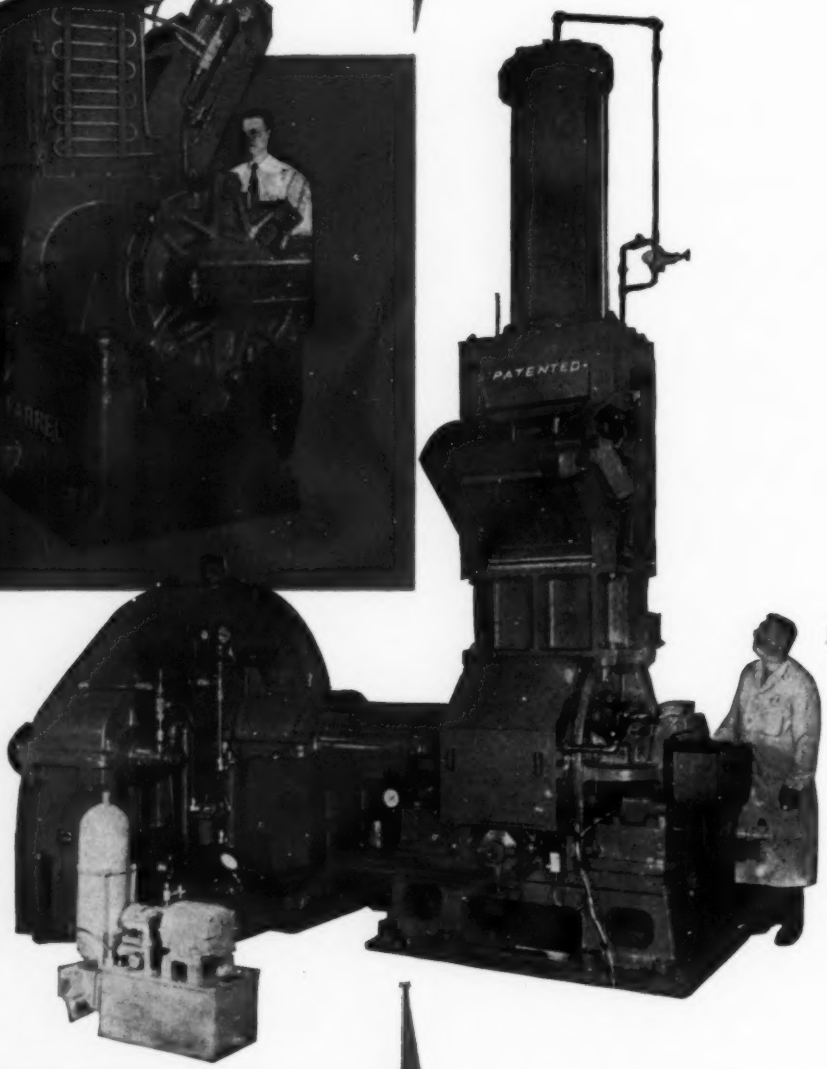

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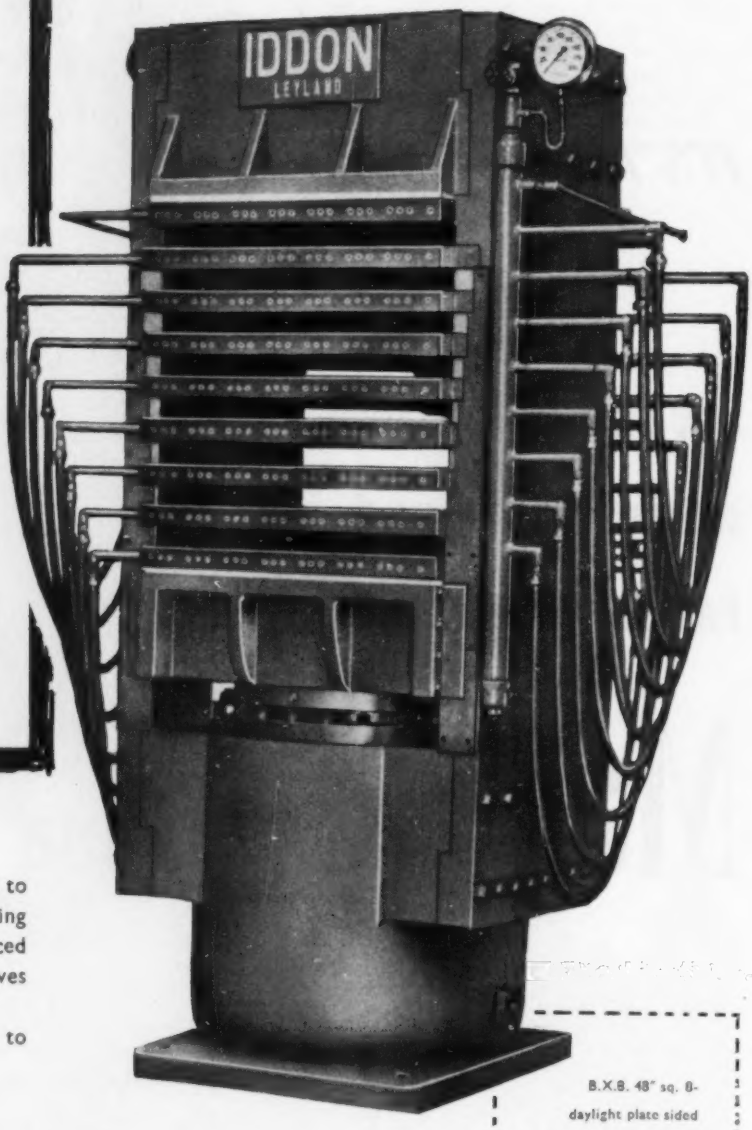

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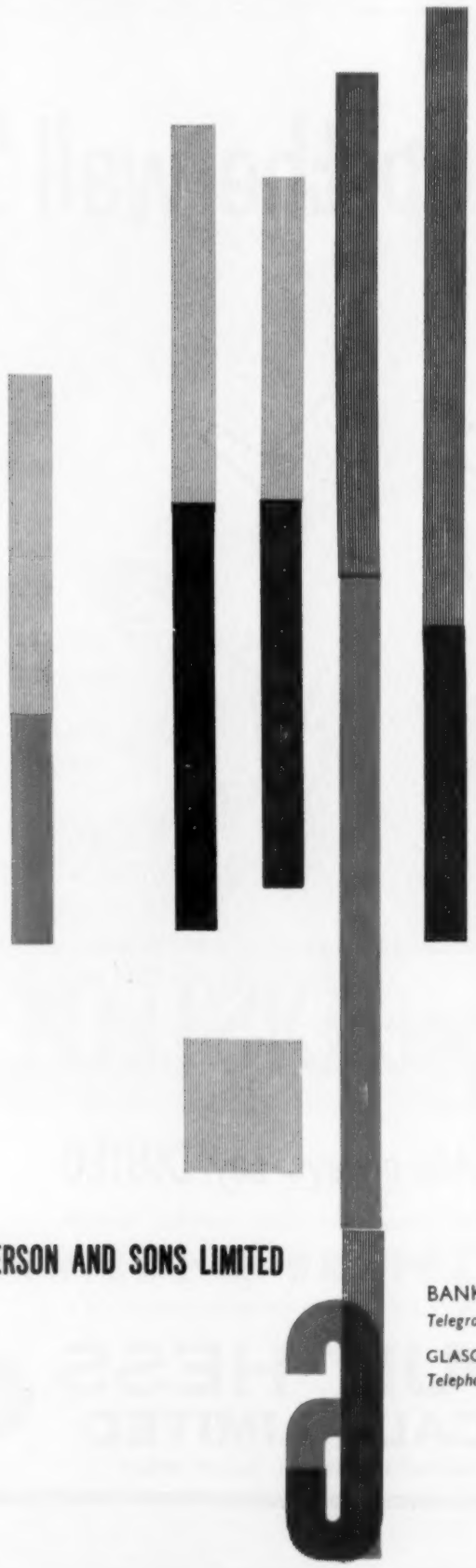

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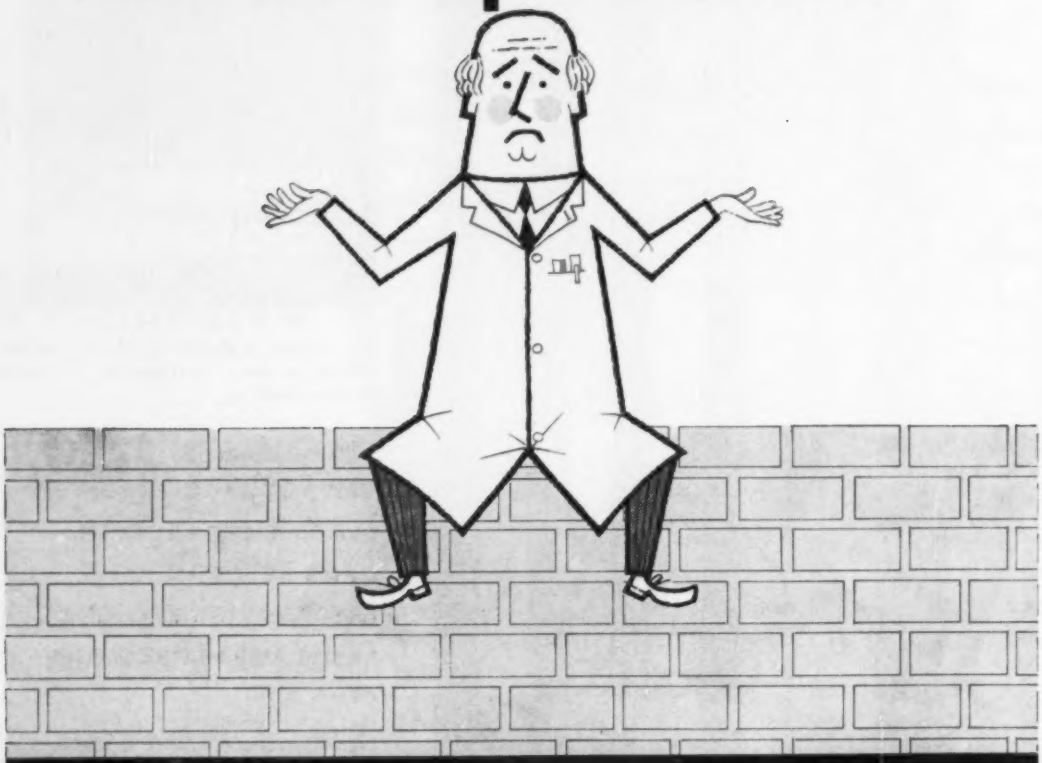

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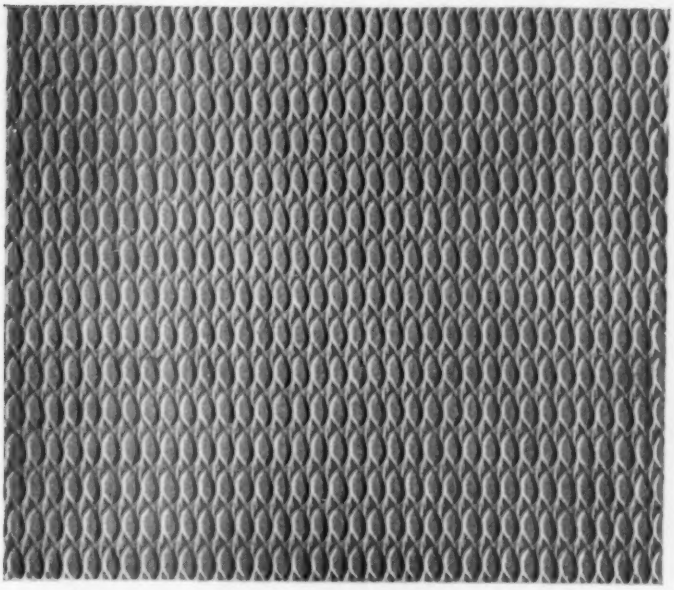

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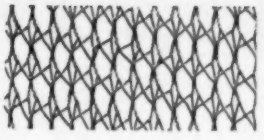

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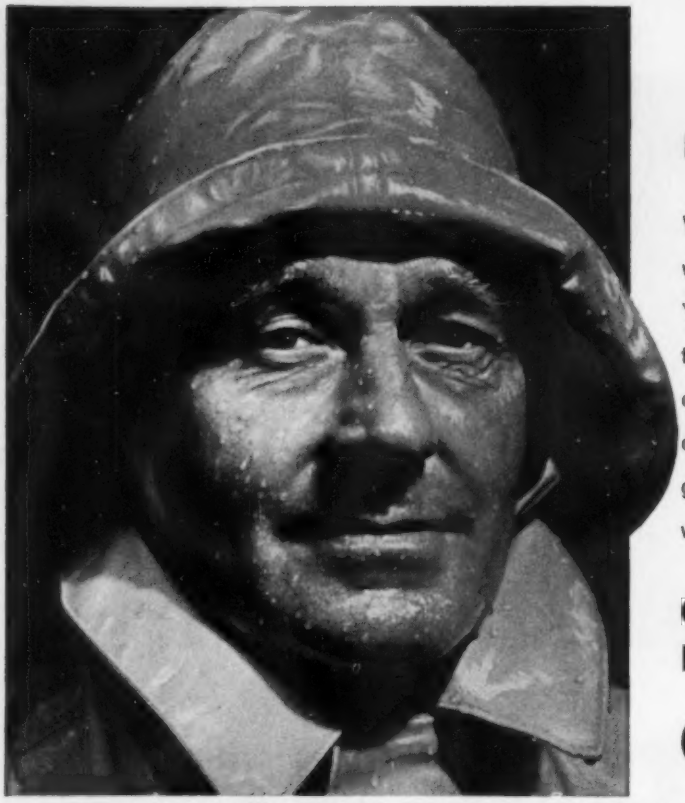

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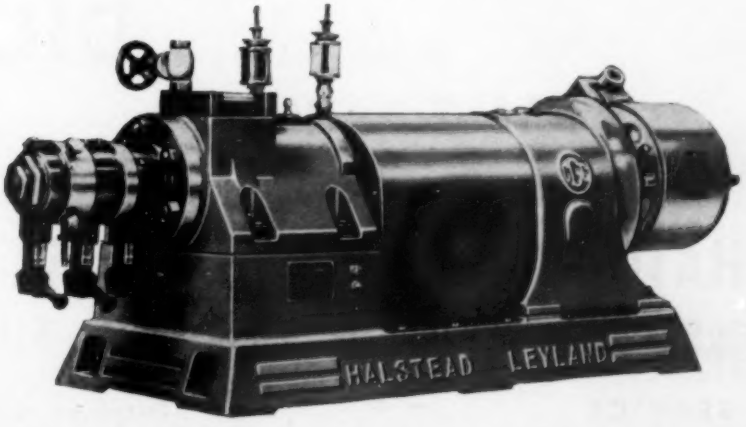

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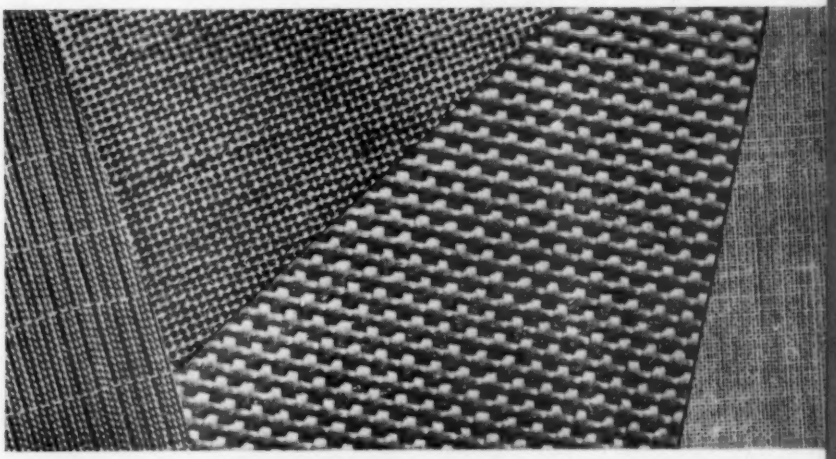

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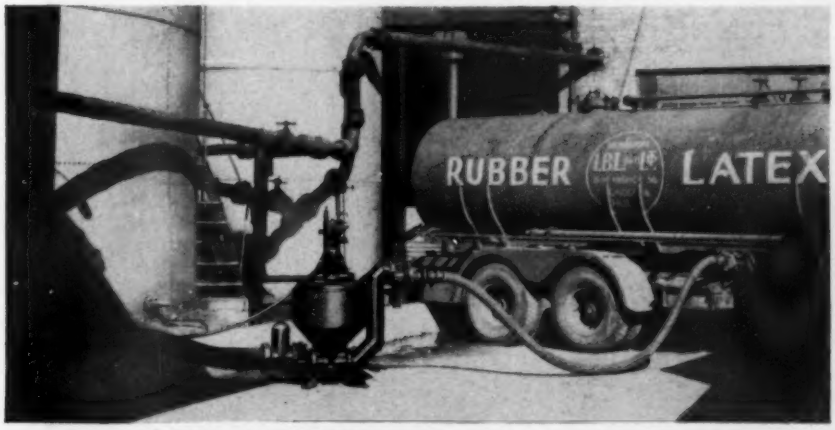

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IN ITS 77th YEAR

November 5 1960

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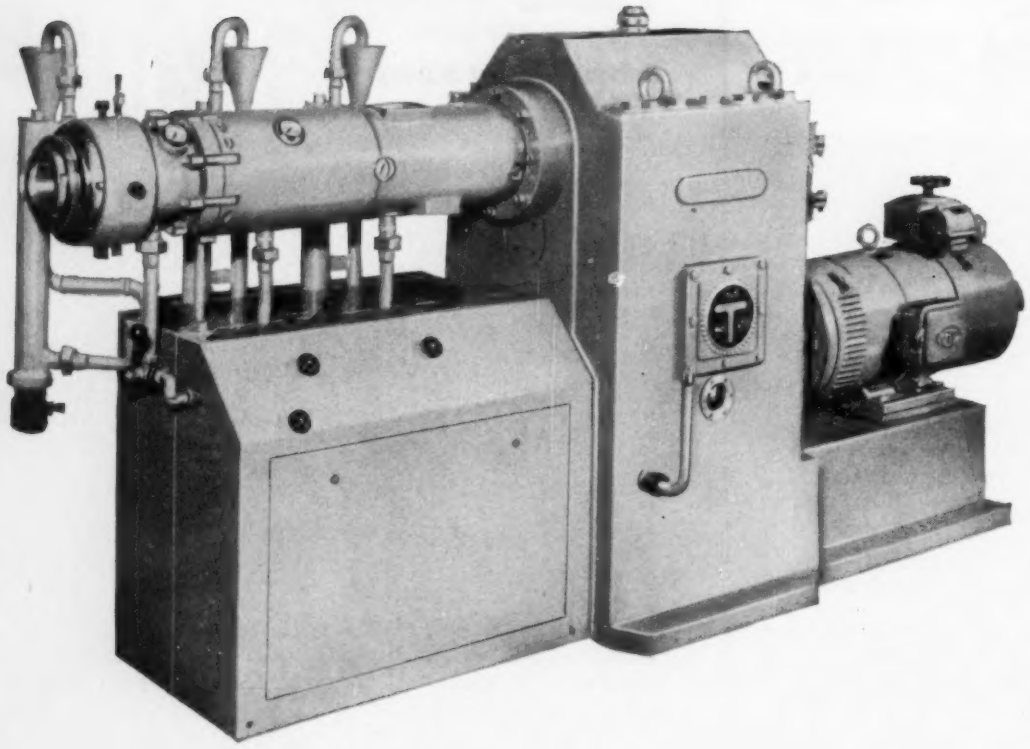

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NOTES of the WEEK

Plastics in Cars

THE part yet to be played by plastics in the motor industry is vast enough to satisfy all but the most insatiable appetite for astronomical figures. Big enough in terms of tons—long or short—estimates are even more impressive when expressed in pounds. At the recent Detroit Auto Show, Mr W. T. Cruse, Society of the Plastics Industry, said that the only real limit to the use of plastics in cars is the ingenuity of the design engineers and their knowledge of the materials they have to work with. The 1961 American models, he said, include an estimated 22lb. of plastics per car. Since the models have appeared in showrooms, other estimates have been that as much as 30lb. per car is being used. The 22lb., he added, replacing 150lb. of metal, excluded upholstery material, paints, finishes and so on. In an all-plastics 'composite' car on view at the show (*RJIP*, October 22, 1960, p. 685), plastics parts were used in every engineering section: engine, transmission, chassis, electricals, body, styling and accessories. Mr Cruse's estimate for 1970 consumption of plastics by the US motor industry was a 'conservative' 500,000,000lb. Continuation of the growth rate of plastics in the US motor industry should result, he said, in annual savings of more than $100,000,000 for the industry by 1970. It is reasonable to assume that the motor industry in this country will make at least a proportional use of plastics ten years from now. This would mean that the present average of something like 15lb. per car would increase to around 25lb. per car—and that can properly be labelled 'very conservative.'

Plantations Amalgamate

THE offer made this week by the Kuala Lumpur Rubber Co. Ltd. for the capitals of five other rubber plantation companies (referred to in this issue) is the largest such move in the history of the industry. The amalgamation, the terms of which have been agreed by the Boards, will—given 100% acceptances of the offer—bring under single control a planted acreage of more than 82,000 and capital totalling £3,508,652 to make Kuala Lumpur-Kepong Amalgamated Ltd., the proposed new title, one of the largest rubber plantation companies. For interest, these figures may be compared with Anglo-Indonesian Plantation's capital of £3m. and 36,000 acres (rubber); London Sumatra's 73,000 acres and just over £1m. capital; Malayalam's £2.7m. capital and 20,000 acres (rubber); United Serdang's £1m. capital and 76,736 acres; Highlands and Lowland's £2.1m. and 60,000 acres, and Seafield's £2¼m. and 47,000 acres.

Total estimated production of the proposed group's Malayan estates (74,000 acres, of which 54,700 are mature rubber) for the year ending September 30, 1961, is approximately 36m.lb. Recent references to the potential of high-yielding plants make it of interest to note that the yield per mature acre (Malaya) for the six companies concerned in the amalgamation averaged 651 for the year ended September 30, 1960. Highest was that of Kuala Kangsar, 889lb., and lowest, the Kepong Group with 565lb. The K.L. Group averaged 721lb. for its Malayan plantations and 671lb. for those in Indonesia. All the companies concerned have progressive planting policies and one of the advantages of the amalgamation can clearly be that new techniques will be more rapidly adopted and exploited. Likewise the already extensive replanting and new planting programmes will mean steadily increased production.

Price of Rubber

LAST Monday's spot price for natural rubber, 26½d., touched its lowest level since March 18, 1959. This followed a steady drop over the past two weeks. Lack of demand from consumers, notably the tyre manufacturing companies, and the heavy stocks which have now built up in Singapore, are the main causes of the drop in price.

Profit Sharing

INTERESTING addition to the ranks of those companies with profit-sharing schemes is the Greengate & Irwell Rubber Co. Ltd. The company has an existing profit-sharing scheme which applies to fortnightly staff and to those paid weekly, but the new scheme, based on funds accumulated from a trust set up as long ago as 1932, will affect members of the monthly salaried staff. They are to be allocated dividends from units of the company's ordinary stocks. Staff affected will hold units according to their status, income being governed by the amount of the dividend recommended by the board. This move—a wise and welcome one—will give management staff a direct and individual interest in the profitability of the company.

NEWS *Briefs*

GOODYEAR $1.25m. AKRON EXPANSION—UAR IN THAILAND — DUTCH ACETAL RESIN PROJECT INDIAN COMPLEX PLANS—METHANE DISCOVERY

●**Thailand** — General Tire and Rubber Co. of USA are said to be negotiating to set up a plant to produce 120,000 sets of tyres and tubes a year.

●**Liberia** — Considerable increases in rubber exports are predicted. Firestone Plantations intend to double their mill lines and drying capacity for crepe from Liberian-owned plantations, to deal with a total of some 36m. lb. of dried rubber a year. The greatest obstacle to the increased production of rubber is likely to be the absence of a sufficient reserve of manual labour for tapping.

●**Brazil** — A new firm, Ebeq — Produtos Quimicos Industrials Ltd. — has opened an experimental plant in Sao Paulo for the manufacture of adhesives for industrial purposes. The factory has already completed deliveries to a number of concerns, including plastics manufacturers.

●**Italy** — Discovery by ENI of a methane gas field at a depth of 1,500 metres in the sea strip facing the Ravenna coast was recently reported by Signor Enrico Mattei, the company's chairman.

●**South Africa** — Dunlop South Africa Ltd. and Lintafoam South Africa (Pty.) Ltd. will shortly form a joint company to be known as Dunlop-Foam (Pty.) Ltd. This company will acquire the Dunlopillo side of Dunlop South Africa and the Lintafoam business in South Africa. It will be a Dunlop South Africa subsidiary. This arrangement does not affect Dunlop or Lintafoam in the UK.

●**France** — Goodyear's new tyre plant at Amiens was inaugurated on October 27 by M. Jean-Marcel Jeanneney, the Minister for Industry. Initially, the plant is producing 2,000 tyres a day. Goodyear has invested 50m. new francs in this plant which is aimed at facilitating sales in the Common Market.

●**Holland** — A multi-million guilder plant is to be built at Dordrecht by Du Pont for processing Delrin acetal resin for use by the Western European market. Construction is expected to be under way this month and production operations are scheduled to commence in 1962.

●**Italy** — The Ministry of Transport is to sell by public tender 180 tons of natural No. 1 RSS rubber and 300 tons of No. 2 RSS from the State-owned stockpile. The rubber cannot be sold to foreign bidders.

●**Brazil** — Pirelli S.A. Companhia Industrial Brasileira, a subsidiary of the Italian firm, has raised its capital from Cr. $2,000m. to Cr. $3,000m., through new subscriptions and the import of equipment.

●**India** — The plant, to be placed in operation near Bombay within 3-4 years following an agreement between the Indian Government and the group of German chemical manufacturers Bayer AG-Badische Anilin-Hoechst-Uhde, will produce chemical intermediates, including rubber chemicals and synthetic resins for surface coatings. The machinery and equipment, to be bought abroad, plus technical aid and patent rights, will cost an estimated $8.4m. The agreement also comprises mutual access to any process improvements within the next 10 years.

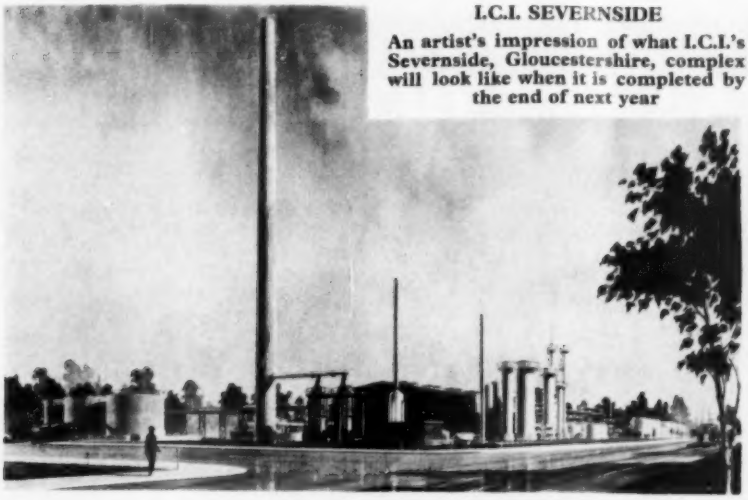
●**Thailand** — A United Arab Republic economic mission headed by Mohammed Araba, director-general of the export department, has arrived in Bangkok to discuss trade with Thailand. The mission is said to be interested in buying Thai rubber.

●**United States** — Goodyear Tire and Rubber Co. is expanding its Akron plant for production of Chemigum and rubber and synthetic latex. The project, valued at $1.25m., will provide for the enlargement of storage and production buildings as well as for new equipment which, it is said, should result in a capacity increase of 15%.

●**Holland** — The Dutch contracting group Comprimo is undertaking the construction of the Shell polypropylene plant at Pernis.

●**Singapore** — The two Russian ships, *Dzierzynski* and *Metallurg Baykov*, arrived in Singapore on November 1 to load 18,900 tons of rubber for Odessa which had been bought for October shipment. Two more Russian ships are due to arrive this month.

***'I think that I shall never see a poem lovely as a tree'*—509**



I.C.I. SEVERNSIDE

An artist's impression of what I.C.I.'s Severnside, Gloucestershire, complex will look like when it is completed by the end of next year

Developments on Tees-side

RAPID PROGRESS AT SEVERNSIDE COMPLEX

MANY of the Tees-side plants of I.C.I. Heavy Organic Chemicals Division at Wilton and Billingham are currently being modified to obtain, the company says, 'substantially greater outputs with little additional capital expenditure.'

As already announced, manufacturing capacity for high-purity ethylene from the three olefin plants at Wilton is now being stepped up from 120,000 tons to about 140,000 tons a year; there will be corresponding increases of the other products of these plants, for example propylene, butadiene and other C_4 hydrocarbons. This means that larger supplies of feedstocks will be available for the plants at Wilton and Billingham, both of Heavy Organic Chemicals Division and other I.C.I. divisions, which depend on the olefin plants.

Acetone Expansion

For instance, the capacity of the acetone plant is now being expanded from about 28,000 tons to 36,000 tons a year by mid-1961. Acetone is produced by Heavy Organic Chemicals Division at Billingham from Wilton propylene, which is piped under the Tees to the Billingham site. It is used within I.C.I. for the production of methyl methacrylate — the monomer for 'Perspex' — and throughout industry as a general solvent.

Propylene is also converted to butanols at Billingham in part of the carbonylation plants, which are being extended to keep up with the demand for these and higher alcohols, both in the UK and in rapidly growing export markets.

Following a considerable expansion in the production of phenol at Billingham, new equipment is now being installed in the phenol by-products plant complex to enable the combined production of 'Topane' and para-phenylphenol, an intermediate in surface coating resin production, to be raised from some 650 tons to 1,000 tons a year by the end of 1961.

The two para-xylene plants at Wilton are being modified to give a further large rise in capacity. Para-xylene is one of the two major raw materials for 'Terylene' manufacture and is also sent to several countries overseas for the production of polyester fibres.

In the meantime I.C.I. reports that rapid progress is being made with the Heavy Organic Chemicals Division's new plants at Severnside, South Gloucestershire, for 35,000 tons per annum of ethylene oxide, ethylene glycol and associated products. Ethylene oxide will be produced by the direct air oxidation of ethylene supplied by pipeline from Esso Petroleum at Fawley. Outlets for ethylene oxide include acrylonitrile; synthetic fibres, alkyd resins and plasticizers use ethylene glycol.

Air Commodore J. Warburton has been appointed a director of Frederick Braby and Co.

Canadian Plants for Europe

POLYMER CORPORATION BUTYL PROJECT FOR UK

POLYMER Corporation, of Sarnia, Canada, plans to establish two synthetic rubber plants in Europe as part of a $40m. expansion scheme. This was disclosed by Raymond O'Hurley, Canadian Defence Production Minister at a meeting of the Canadian industrial preparedness association.

A 'speciality rubber plant' was to be built in France, he said, and a butyl rubber plant in the UK. No further details of these plants are available, but it is likely that French financial interests will participate in the former plant, while British capital will take part in the UK venture.

Dienes at Sarnia

Part of the Sarnia plant is already being extended and it is thought that a solution polymer plant to make polybutadiene and possibly polyisoprene forms part of this scheme. Mr O'Hurley said the domestic expansion will take two or three years to complete, and will increase total production of the corporation from 150,000 tons to more than 200,000 tons a year.

He indicated that the Canadian Government was still considering the possibility of selling the huge synthetic rubber complex that was built during World War II to provide a domestic supply of rubber. However, he added, a decision to sell could not be taken lightly.

The Minister went on 'One thing, however, I can say categorically; there will be no sale which does not carry with it an unqualified guarantee that Polymer Corp. will continue to exist as an integrated Canadian enterprise, with all its extensive research and development and production facilities intact.'

Mr O'Hurley said that Polymer Corp. was heavily committed to export sales but the outlook was clouded by the rapidly changing economic climate abroad. Polymer Corporation officials and the Canadian Government were agreed that the corporation's position in export markets could be maintained only by a continuous, vigorous programme of expansion.

Since 1945, Polymer's output has tripled from 50,000 tons annually, and value of capital investment has doubled from $50m. to $100m. The concern employs 2,600.

British Exhibition in Russia

INTO THE MOSCOW TRADE FAIR RIDE THE 600

SOME 600 UK companies are to take part in the British Trade Fair to be held in Moscow's Sokolniki Park next year, May 19-June 4. Occupying four halls on an exhibition site area of 1m. sq. ft. and with a covered space area of 228,000 sq. ft., it will be by far the largest foreign fair yet held in Russia.

This information was given earlier this week at a Press conference presided over by the Earl of Drogheda, chairman of Industrial and Trade Fairs, which is organizing the fair. The speakers included Mr Reginald Maudling, President of the Board of Trade; Sir James Hutchison, president of the Association of British Chambers of Commerce; Mr V. G. Sherren, director-general of the British Trade Fair; and Mr I. Bolshakov, vice-chairman of the Soviet Committee for Cultural Relations with Foreign Countries.

An encouraging number of British rubber and plastics manufacturing companies are among the exhibitors. These include:

BTR Industries Ltd., Microcell Ltd., Glass Yarns Machinery Ltd., and Glass Yarns and Deeside Fabrics Ltd., who between them will show glass fibre reinforced plastics processing plant; belting; hosiery; PVC pipes, fittings, mouldings and extrusions; footwear.

Baker Perkins (Exports) Ltd., and subsidiary companies including the Granbull Tool Co. Ltd., will show plastics bottle and container manufacturing and other machinery.

Burtonwood Engineering Co. Ltd.

CIC Engineering Ltd., high pressure shoe vulcanizing machinery.

Lesney Products and Co. Ltd., plastic ball manufacturing equipment.

Rustfya Ltd., the consortium which includes David Bridge and Co. Ltd. and Francis Shaw and Co. Ltd., will show rubber processing mechanical handling equipment and electrical equipment for tyre manufacture.

British Titan Products Co. Ltd., titanium oxide pigment.

Cascelloid and Halex, divisions of British Xylonite Co. Ltd.

Dunlop Rubber Co. Ltd., together with Dunlop Advisory Services and Metalastik Ltd., will show a wide range including Dunlopillo latex foam, sports goods, general rubber goods and flooring materials.

Formica Ltd. will show various applications of their laminated plastics.

Imperial Chemical Industries, including Imperial Aluminium Co. and Yorkshire Imperial Metals, will have a composite exhibit featuring dyestuffs, plastics, synthetic fibres, chemicals.

The Rubber Improvement Group of Companies are to show sheet, reinforced and quilted PVC; glass fibre sheets; rubber and vinyl flooring; PVC/Terylene conveyor belting; footwear.

Turner Bros. Asbestos Co. Ltd., and associated companies including the Washington Chemical Co. Ltd., are to show chemicals; rubber and PVC beltings, etc.

Barrow, Hepburn and Gale Ltd. and associated companies are to show a representative range of their many products.

R. H. Windsor Ltd. are to demonstrate the AP30/115 and SP7 injection moulding machines.

Fire at Goodyear Works

PLANT OUT OF ACTION FOR SOME WEEKS

THE fire at the Goodyear Tyre and Rubber Co.'s remould plant at New Addington, Surrey, on October 23 partly destroyed the roof and the majority of the stock. Local reports stated that 2,000 tyres and 4,000lb. of rubber were destroyed in the blaze that took ten fire engines nearly two hours to get under control.

[Photograph: Croydon Advertiser

Part of the gutted factory the morning after the blaze

Machinery Damaged

A limited amount of damage to machinery was also caused. It is estimated that the plant will be out of action for a number of weeks. In the meantime, the company's Watford, Herts., depot is maintaining services to customers.

The New Addington plant has been in production only since early this year. During the reconstruction period, a number of employees have been found other work.

First reports indicated that the cause of the outbreak was an electrical fault, but this has not been officially confirmed.

Plantation Amalgamation

LARGEST RUBBER PLANTATION COMPANY

THE Kuala Lumpur Rubber Co. Ltd. has made offers for the capitals of five other rubber undertakings to effect an amalgamation. The companies concerned are:

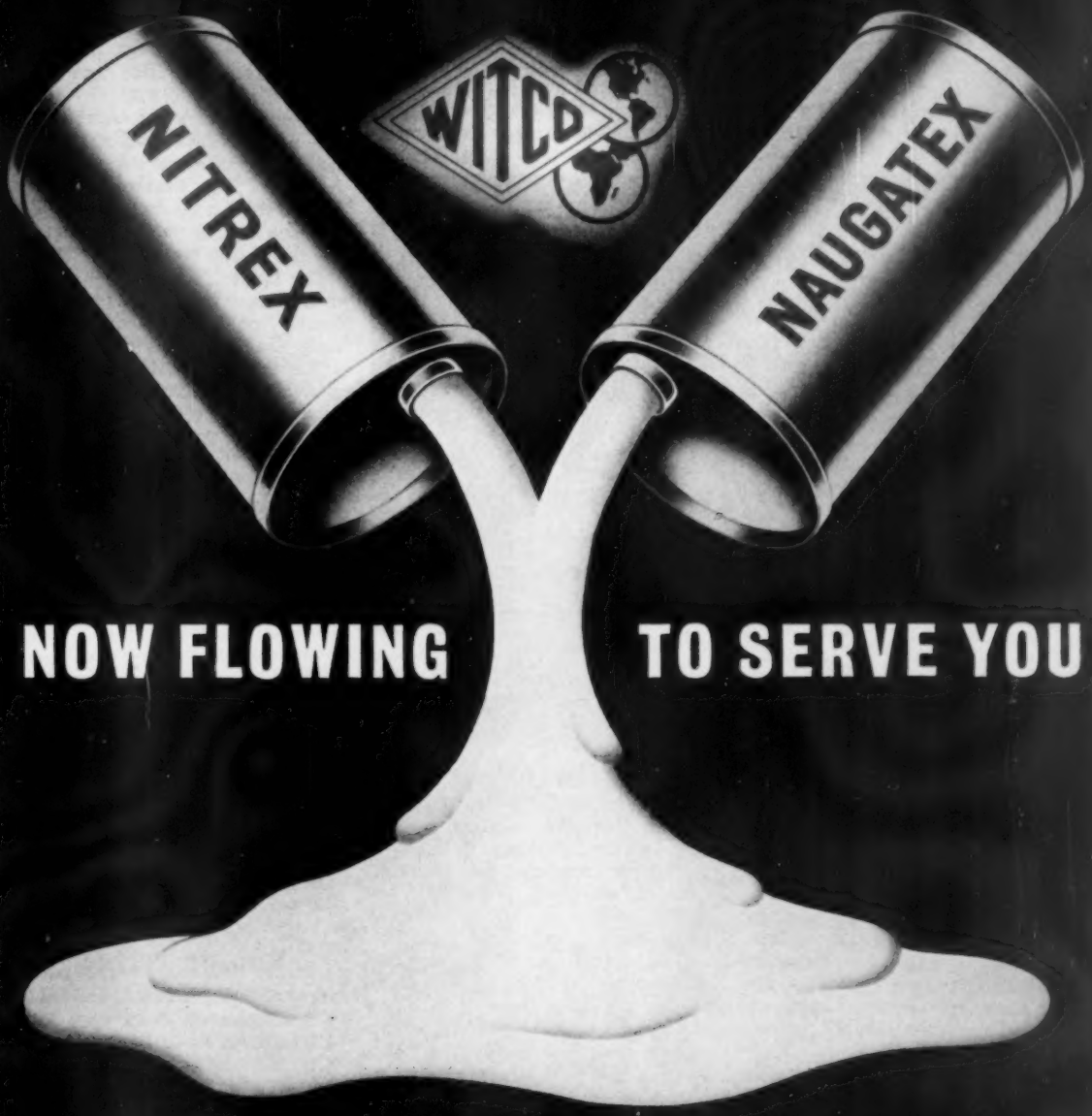
	Acres	Capital £
Tanjong Malim ..	8,893	500,000
Glen Muar Estate ..	2,788	124,791
Kepong (Malay) ..	32,918	1,048,410
Caledonian (Selangor)	3,152	169,820
Kuala Kangsar ..	3,844	131,250
Kuala Lumpur ..	32,741	1,398,591

As Kuala Lumpur and Kepong are the largest companies in the amalgamation, it is proposed, in the event of the offer for Kepong capital becoming unconditional, to change the name to Kuala Lumpur-Kepong Amalgamated Ltd. The directors of the five companies have recommended acceptance of the KL offer.

If 100% acceptances are received the issued capital of Kuala Lumpur

Continued on page 779

SYNTHETIC LATICES



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These Butadiene-Styrene and Nitrile types will come on stream in 1962 at Stoke Prior (Worcs.) in a new plant operated by Witco and the United States Rubber Company. Interim importation and bulk storage facilities in U.K. have been arranged.

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425oz. Injection Moulder

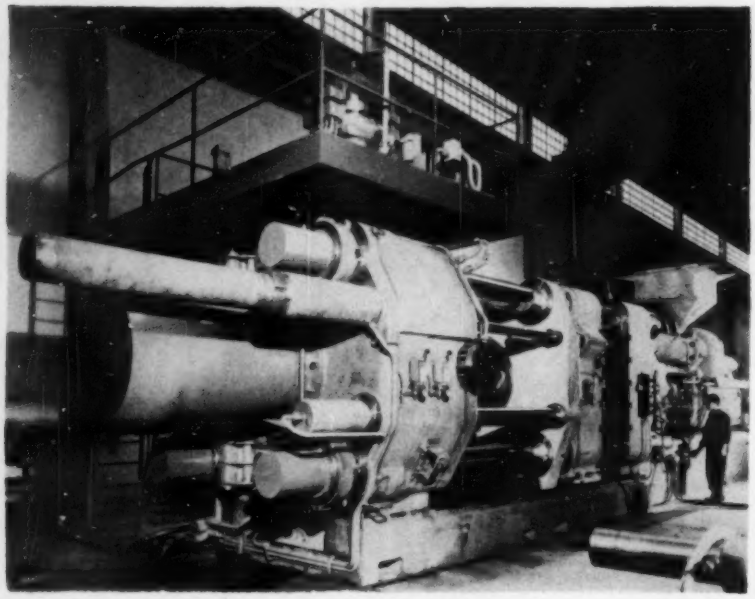
MARKETED IN UK BY BAKER PERKINS

WHAT is claimed to be one of the largest and most powerful injection moulding machines in the world — it has an injection capacity of 425oz. — has just been produced by Triulzi of Milan.

The unit is the first of three destined for a German manufacturer for the production of refrigerator cells.

The reaction cylinder is coupled to the moving platen which embodies a large section short stroke hydraulic pressing piston producing the real clamping force of the unit.

In the clamping operation, the platens approach at low force until they meet. The blocking wedges insert themselves in the reaction cylinder. The hydraulic clamping cylinder, finally, goes under pressure and maintains it until the injection is over. The opening sequence is in three parts: pressure into the hydraulic cylinder, unlocking of wedges and finally, platens opened by means of small auxiliary cylinders.



The machine will be sold in the UK and the Commonwealth by Baker Perkins Granbull Ltd., Kingston-on-Thames, who supply the full Triulzi range and also manufacture some of the models.

Output is high, at the rate of one cell every two minutes and the company says that the machine represents a further step in its efforts to improve automation, reduce prime costs and provide large units suitable for producing household articles.

The machine is manufactured for automatic cycle operation but every movement can be controlled separately. In both automatic cycle and push button control the platens clamp only after a pneumatically controlled safety gate has been dropped.

The locking is obtained through a blocked piston. The group consists of a reaction cylinder sliding in the reaction head which is pushed by two small approaching cylinders in the locking position and then blocked by means of hydraulically controlled radial wedges, made of treated steel, acting on the whole cylinder section.

This system operates a quick and stiff mechanical blocking, still maintaining the advantages of piston clamping since it enables long strokes to be obtained for deep pieces. Also, there is low fluid absorption and no hard stresses as the movements of the mechanical blocking device take place without pressure being applied.

The injection and preplasticizing group slides on a bedplate enabling the nozzle to be moved away from the mould for special working or maintenance and cleaning. If required the group can be blocked in the required position.

The group consists of the injection chamber, specially designed for coupling to the preplasticizer; a screw preplasticizer with a 6½in. diameter screw, operated by an electric motor and fitted with a speed variator for the screw revolutions so that the plasticizing action can be varied to suit the material and quantities used.

The injection force can be adjusted up to a maximum of 220 tons and with a standard injection plunger it is possible to obtain up to 22,000lb./sq.in. With this pressure and with very high injection plunger speeds it is said to be possible to process any thermoplastic material and obtain thin walled mouldings.

The machine, which is described as the 12/350/2200, has a cast steel body with rolled steel sections in the bedplate. The rams and tiebars are ground and hard chrome-plated. Steel and special materials have been used for the sliding parts and components under stress. The hydraulics, valves, distributors and servo-controls are located on an accessible platform fitted over the reaction head.

All the electrics, timers for setting time, electronic readings and automatic controls of the temperature are located in a special sheet-sealed box protecting them from dust and temperature variations. All the electric equipment is separate from the machine so that no possible vibration can effect them.

Other details are:

Clamping force ..	2,500 US tons
Max. injection force	220 US tons
Injection capacity	425oz.
Plasticizing capacity	770lbs./h.
Max. mould thickness	47in.
Min. mould thickness	28in.
Moving platen stroke	59in.
Platens dimensions	83 x 79in.
Weight	approx. 175 US tons
Overall size ..	approx. 58 x 11 x 15ft.

Triulzi is also planning the manufacture of a 3,300 ton model with a 705oz. injection capacity.

Rubber Exchange

A COMMITTEE decided on October 28 to set up a Rubber Exchange in Kuala Lumpur. At present the exchange which deals in Malayan rubber is in Singapore.

It was announced that the recommendations of the committee would be submitted to Inche Mohammed Khir Johari, Minister of Commerce.

Asked to comment on possible USA support for the formation of the exchange, the spokesman said: 'The Government hopes to get help from experts.' (Tunku Abdul Rahman, Malayan Prime Minister, is reported to have discussions on the formation of the exchange with Christian Herter, US Secretary of State.)

Plastics Processing Congress

ACRYLIC POLYMER EASES PRODUCTION

(Continued from October 29 issue, page 727)

THE 48 lectures given during the congress in Amsterdam were divided into three concurrent sessions. Each group of lectures was on a slightly different aspect of plastics technology, the divisions being as follows: section 1, processing techniques and principles of machine design; section 2, processing behaviour of specific plastics; section 3, miscellaneous processing techniques, reinforced plastics and foams.

Summaries of a few of the papers are given here, and later issues of *RJIP* will contain further reports.

Polymer Flow

R. L. Ballman of Monsanto Chemical Co., delivered a highly mathematical talk on the prediction of the flow of a polymer melt into a cold cavity in which, with the aid of a good many complicated mathematical formulae he showed that the gross flow process which took place when a molten polymer was forced into a cavity whose walls were held below the glass transition temperature of the polymer might be predicted from the rheological and thermal properties of the polymer, by simultaneously solving approximate forms of the energy equation and the equation of motion on a digital computer.

Flow of this type occurred in several plastics fabricating processes such as injection and compression moulding, in die casting of metals and in nature as in lava flow. It was shown that steady flow of a liquid through a closed channel whose walls were held below the freezing point of the liquid was possible only for channel lengths below a certain critical value. For lengths above this value the frozen skin of the walls would fill the entire channel and choke off flow. For an initially empty, cold channel, steady state flow could be attained only if the channel length was less than the critical value. If the channel was longer than this critical length, flow could proceed for only a finite time and no steady state was possible.

Non-isothermal polymer flow had been described by simplified energy and motion equations which had been programmed for the 704 IBM digital computer. Data was obtained as mean velocity *vs.* time of flow from which the position of the wave front could also be determined. These results had been compared to experimentally determined velocities obtained by injection moulding polystyrene into a cold die. Generally, agreement between calculated and experimental velocities had been good and it was concluded that the gross flow process as measured by the mean velocity was adequately described by the present model.

Nylon Extrusion

The extrusion of nylon monofilament was dealt with in a paper by E. C. Schule and C. D. Spencer whose studies of the preparation of nylon 6 monofilaments had shown that normal processes for monofilament could be used. The process consisted of extrusion of filaments, quenching in water, stretching between Godet rolls, and winding. To produce satisfactory filaments, it was necessary to use at least two stretching zones. Higher tenacity monofilaments could be produced at higher production speeds in a double stretch. It was also possible to incorporate relaxation or annealing into the process, if desired, when more than one stretching zone was available.

The four most important process variables found in the study of nylon 6 monofilaments were draw ratio, filament size, winding velocity, and stretch temperature. The very high speeds of stretching used in monofilament preparation could cause shock type failures to the nylon and thereby limit the degree of orientation. By using heat during the stretching operation, it was possible to achieve high draw ratios at high speeds of operation.

The study of time-temperature effects in the stretching of monofilaments showed an increase in tenacity with time at a given stretch temperature and stretch ratio, a corresponding increase in elongation and a decrease in tensile modulus. Filament diameter was also important in determining physical properties due to the complex effect associated with quench temperature, heat transfer rate through the plastic and rate of crystallization. In this case, at fixed stretching conditions, it had been found that tensile modulus increased, and tenacity and elongation decreased with an increase in filament size. A minor effect had been also noted in increased tenacity with increased melt draw down from the die. Extrusion conditions had been found to have virtually no effect on orientation and physical properties. Nylon 6 resin properties were most important in setting final monofilament properties.

Melt viscosity studies had been incorporated into the monofilament project to provide data for proper die design and to assist in studying resin characteristics. Nylon 6 was found to withstand very high melt shear rates without evidence of melt fracture.

Moisture Control

In his lecture on the importance of moisture control in the processing of polyamides, J. C. F. Kessler said that in injection moulding or extruding little attention was usually paid to the influence of the atmosphere around the apparatus on the quality of the material to be processed. Although it was generally known that certain materials, such as polyamides, were sensitive to moisture and therefore were sold dry in airtight containers, it was not so generally realized that significant amounts of moisture could be taken up by the polymer chips during their stay in the processing apparatus. Particularly the upper layer of a hopper load would be in contact with the surrounding atmosphere for a prolonged period.

Simple experiments with the usual processing equipment illustrating this effect were described, namely: (a) injection moulding into a spiral mould and (b) extrusion of a tube of small diameter.

In case (a) the spiral length and the steam embrittlement of the material after moulding and in case (b) the diameter of the tube had been measured over a period corresponding with a full hopper load.

It had been found that the data showed considerable variations, particularly when the hopper was almost empty. When the chips were sealed from the surrounding atmosphere

Continued on page 781

Papers From Berlin

DEVELOPMENTS IN SYNTHETIC RUBBERS

AMONG the papers given at the rubber congress in Berlin from October 4-8, organized by the Deutsche Kautschuk Gesellschaft were many describing recent developments in the production and evaluation of the newer synthetic polymers. Summaries of a few of these are given below.

Dr Giulio Natta was the co-author of a paper read by Dr G. Crespi on the rubber-elastic properties of ethylene-propylene copolymers.

Recent work, said Dr Crespi, had made possible the synthesis of highly regular polymers which formed a good starting point for the production of elastomeric copolymers. Of particular interest were the copolymers of ethylene with α-olefines, the visco-elastic properties of which had been studied by stress-relaxation measurements.

One of the first problems to be solved was that of vulcanizing the copolymers, which due to their predominantly high saturation could not be cross-linked by normal reagents.

Various methods were used, including modifications of methods applied to polythene and new methods were worked out which gave products with better characteristics.

Cross-linking by prior chlorosulphonation gave products with high tensile strength. Increasing sulphur and chlorine content caused a reduction in rebound resilience and elongation at break and increased modulus.

The use of organic peroxides, radical initiators and unsaturated compounds of an acidic nature also gave satisfactory results and it was found that small amounts of zinc oxide improved the mechanical properties probably because of salt formation caused by the dicarboxylic acid grafted onto the copolymer chain. Accordingly experiments were done in which a dicarboxylic acid was grafted on in a separate stage of the process and vulcanization effected by means of a metal oxide alone. By this means and by the use of acidic fillers such as channel blacks or acidic silicates, vulcanizates were obtained with very good mechanical properties and excellent resistance to ageing.

Polymerizable Monomers

Another method which gave good results was the use of monomers which could be polymerized by radical mechanisms with small amounts of peroxides. Monomers used included styrene, divinyl benzene and acrylic acid and the properties of the vulcanizates were very interesting as no reinforcing filler was required to give high tensile strength and the monomer acted as a plasticizer before cross-linking. Hydrocarbon monomers also gave vulcanizates with good electrical properties. Methods were also tried using normal vulcanization systems after halogenation of the copolymers and using ethylene and propylene units containing double bonds. The first of these gave products with good dynamic properties at elevated temperatures while the second gave vulcanizates with low tensile strength in the unfilled state but which could, with suitable fillers, give high modulus, high tensile products.

The conclusions to be drawn from the experiments were that these copolymers were very promising and that by varying the method of cross-linking, end-products could be obtained with specially balanced properties.

Resin Rubber Blends

The title of a paper by C. L. Bryant, I.C.I. Ltd., Plastics Division, was 'Properties of some vulcanizable blends of rubbers with thermoplastic resins.' For a long time, he said, the plastics and rubber industries had been growing closer together and eventually would become one. This was a logical step since the present dividing line was purely arbitrary when the similarity between the raw materials and processes was considered. He then went on to discuss a few of the almost limitless possible blends of thermoplastics with rubbers. He described the very wide range of materials which could be obtained by blending styrene/butadiene resins with natural and synthetic rubbers and also discussed the use of polythene in natural, SBR, butyl, neoprene and butadiene/acrylonitrile.

It could be said that polythene offered the rubber manufacturer a range of materials of unique properties by means of which improved processing characteristics and physical reinforcement of the rubbers could be combined with such advantages as resulted from the excellent chemical and electrical properties of the polythene itself.

The use of small proportions of nitrile rubbers as processing aids for PVC had been known for many years, but reversal of the proportions of the polymers resulted in a range of vulcanizable materials which exhibited the properties of vulcanized rubbers but which had some of the desirable properties of PVC. The properties which were improved or conferred on the rubber by the PVC were oil resistance, ozone resistance, weathering properties and, where appropriately formulated, flame resistance. These were of great importance for cable sheathing, hose, extrusions for the automobile industry, conveyor belting and proofed cloth particularly for outdoor use.

Much work had also been done on mixtures of rubber with thermosetting plastics. Phenolic materials

Delegates listening to the lectures during the Berlin Rubber Congress. These are (*from left to right*)**: Dr D. Schmidt, Federation of the German Rubber Industry; Dir. Dr A. Ebert, Vereinigte Glanzstoff-Fabriken; Dir. Dr O. Giese, Gummiwerke Fulda; and** (*visible in the second row*) **E. A. Murphy, Dunlop Research Centre**

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had been used as processing aids and modifiers of nitrile rubbers and small amounts of rubber in thermosetting materials could confer such properties as improved impact resistance.

Butyl Rubber

Butyl rubber and its fields of application were dealt with in a paper by four authors from the Esso Research and Engineering Company.

This gave facts and figures about the development and manufacture of butyl rubber tyres which are now in production in several plants in USA and are being marketed as premium tyres. The American butyl tyre (all butyl as opposed to the composite butyl tyres developed in Germany), was the most thoroughly tested tyre ever to appear on the market.

Road tests covering more than a million miles had been carried out under the most diverse conditions to examine all properties of the tyres and these tests showed that in very nearly all respects and under most conditions the butyl tyres were superior to the control tyres, although the former had slightly higher rolling resistance and consequently rather higher fuel consumption. This must be offset against the advantages conferred by this property of good braking and cornering and excellent antiskid characteristics.

In Germany and elsewhere on the Continent more work had been done on composite butyl tyres which had butyl treads and conventional carcasses. The main problem in the production of these tyres was that of adhesion between the butyl and the carcass but this had been overcome by the use of brominated butyl rubber adhesive tie plies. Fairly extensive tests had been carried out in Germany and also in England on tyres of this kind with results similar to those mentioned above and the future of butyl rubber in tyres both for cars and for heavy duty applications seemed assured.

Polybutadienes

Dr F. Engel, Chemische Werke Hüls, discussed the importance and development of polybutadienes which were the first synthetic rubbers of any economic importance. He described the early attempts to obtain polybutadienes by emulsion polymerization and the production of SBR arising out of this which caused interest in polybutadienes to decrease until recently when because of certain characteristics attention has again been focused on them. These qualities were extremely high abrasion resistance, good hysteresis, freeze resistance, light and cracking resistance and good ageing properties.

Dr Engel then compared the properties of several commercially available polybutadienes from his own and other companies and said that experience showed that because of the processing difficulties most processers recommended the use of blends with natural rubber. Considerable test work had been done on such blends for tyre treads with satisfactory results, abrasion resistance under very severe conditions and heat build-up being particularly good.

The history of synthetic rubber had started with polybutadiene and now after a period this material was again coming to the fore and plants for its production were being erected in many parts of the world, planned capacity in the US alone being almost 200,000 tons a year.

Another paper on polybutadiene was read by Glen Alliger, Firestone Tire and Rubber Company, in which he described the development, polymerization and properties of Diene rubber which was a linear polybutadiene polymerized with an alkyl lithium catalyst. This was an entirely amorphous polymer, largely 1,4 in structure and had a narrow molecular weight distribution. It had resilience, hysteresis and cold properties superior to those of natural rubber or SBR, and blended with either of these materials in tyres it had improved wear and cracking resistance, lower heat build-up, reduced rolling resistance and fuel consumption. Because of the superior low temperature properties these tyres also had better traction on ice and snow.

Mr Alliger described the methods of polymerization and the properties of the raw polymer and vulcanizates. He then discussed at some length the experimental work which had been done on the use of diene/natural and diene/SBR blends in tyres which resulted in the conclusion that these blends produced tyres with improved overall performance which could be manufactured without changing factory methods.

Further summaries will be published in later issues of *RJIP*

Young People's Lecture

The Plastics Institute's 1961 young people's lecture will be on 'Plastics and Textiles.'

Given by H. A. Thomas, on January 2 at 2.30 p.m., at the Institution of Electrical Engineers, Savoy Place, London, W.C.2, it is intended for school children, students, apprentices and works' personnel between the ages of 15 and 18.

BNS Exhibition

British Nylon Spinners is holding an exhibition in its Knightsbridge, London, showrooms (open until November 11). The object of the exhibition is to show recent developments and advances in the setting, dyeing, and finishing techniques of nylon textiles.

PVC Baby Pants

Research by Storeys of Lancaster has led to the production of Stor-Decor 407 PVC sheeting with an extremely soft and kindly handle, especially suitable as a baby pant material.

The following characteristics are attributed to the material: good resistance to plasticizer extraction by water and aqueous solutions of soaps and detergents, and by oils and greases. Repeated washing can be carried out without serious risk of stiffening.

The main physical properties are:

Nominal gauge (in.)	.004
Overall weight (oz./sq. yd.) ..	3.68
Tensile strength (lb./sq. in.):	
Machine direction	2,000
Transverse direction ..	2,000
Elongation at break (%):	
Machine direction	200
Transverse direction	200
Low - temperature extensibility (% at −5°C.)	14
Tearing strength (Elmendorf) (g./thou.):	
Machine direction	45
Transverse direction	45
Soap extraction (% loss) ..	9

Storeys state that until manufacturers have had an opportunity of testing the material the above-mentioned properties should be regarded as tentative.

New Goodyear Flooring

Goodyear (GB) Ltd., of Wolverhampton, are marketing a new type of vinyl flooring. Among advantages claimed for it are its pre-polished surface, ease of maintenance, warmth, and safety factor.

Manufactured in 9in. tiles the flooring comes in two types: 'No-Scrub' for domestic use, and a heavier gauge commercial type 'Supreme.'

Malayalam Plantations

At a meeting of the Board of the Malayalam Plantations Ltd. held on October 27 1960, Mr H. W. Horner resigned the chairmanship and his directorship of the company after 23 years' service on the Board. Mr J. Sands was elected as chairman of the company and Mr F. W. Harper was appointed a director.

With only 5 months left

5 time is getting short

In April, 1961, employers will be compelled to participate in the new State Pension Scheme—unless they can provide a privately arranged scheme offering equivalent or superior benefits.

Whether or not it is advantageous to contract out will depend upon the age and salary levels in your own company, the importance attached to good relations between management and workpeople and various other factors. Many employers, faced with this complicated problem, remain undecided. Those who hesitate for long will soon have their minds made up for them, since companies which have not obtained a contracting out certificate by April 3, 1961, will automatically find themselves liable to pay the new additional contributions.

The Noble Lowndes Pension Service is uniquely qualified to advise you on this subject. As the leading consultants, responsible for administering pension schemes on behalf of nearly 5,000 companies and firms, they are not publicly committed either for or against contracting out and are therefore free to advise on the basis of the facts in each particular case without preconceived ideas. There is still time for you to seek their advice, but remember—you have only 5 months to decide. Enquire now!

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VIEWS *and* REVIEWS

I SUPPOSE it is simply lack of time that makes some of our technical authors appear satisfied with less than the best. We are offered so many papers and lectures with titles beginning: 'Some Problems in . . .' or 'Some Aspects of . . .' or 'Some Recent Developments in . . . ,' that it is a welcome change to meet the title 'Fundamental Problems of Latex Technology. Part 1.' It gives us the idea that at last we are to have a really complete survey and we are certain we have come across an example of German thoroughness when the introductory paragraph reads:

'The processing of rubber latices is one of the most recent specialized fields of rubber technology. Latex foam rubber manufacture has itself developed in the last ten years to one of the largest consumers of rubber. At present the existing technical literature in this new branch of industry is still understandably incomplete. Single monographs in technical journals, many scattered articles covering aspects of the subject, and some small books, mostly from the English- and French-speaking world, are the sole documentation at present. A complete collection of the scientific problems of latex processing technology does not seem to exist. This report is intended to be a contribution to the classification of some of the fundamental questions of latex technology. . . .'

That is a bit sweeping, perhaps; it seems especially hard on Dr C. F. Flint's admirable book on Latex Technology. But more disappointment is in store for us. The author, having led us to a point where we can take a view of the promised land, suddenly says: 'The author deliberately confines himself here to a few problems which seem important to him. The work can thus make no claim to completeness . . . it can likewise be esteemed as only a fragmentary contribution to latex technology.' Well, there we are again. That is what it says. (Translation E. and O.E., I ought to say.)

Nevertheless, I suspect that the author is being not quite fair to himself, because what he has written is very good and contains several original contributions to published thought on the complex problems in this field. Also, it is only Part 1, with no indication as to how many other parts he contemplates. I, for one, hope that his pen will not tire until he has made a reasonably complete survey of this field in which he is evidently an expert.

New Thoughts in Latex Technology

The author is G. Saffran, the title is 'Grundlagenprobleme der Latextechnologie, Teil 1,' and it appears in *Plaste und Kautschuk*, vol. 7, No. 9. September 1960. Pp. 435-442. It discusses problems and propounds theories which I have not met before outside private discussions.

It starts with a consideration of particle size, frequency, and shape. Each type of latex has its specific size-spectrum which is determined by the polymerization conditions under which it was produced: the faster the polymerization the smaller the particles. The smaller the particles the higher the viscosity of the latex.

There are several methods of measuring the particle size, and the results can be conveniently recorded as frequency curves (examples are given for Revertex, Jatex centrifuged, and Buna S-3 polymerized in three different ways). It is claimed that from such curves other useful properties can be estimated, *e.g.* syneresis, drying time of the gel, the degree of stability and hence the need for added protective colloid or destabilizer, and the hardness or, rather, density of the latex foam rubber made from it. There follows some discussion of the possible mechanism of the changes in elastic properties brought about by different conditions of polymerization.

Coagulation Phenomena in Latex Foam Manufacture

The shrinking of the rubber gel depends substantially on the size and shape of the rubber particles in the latex. The interstices between the particles, which immediately after coagulation are filled with serum, induce very high capillary forces tending to squeeze out the serum. Providing the interstitial size is not below a certain limit and the frequency range is narrow, the serum is not difficult to eliminate, but, with very narrow capillaries (such as might be produced by small particles and/or a wide range of particle sizes), removal of the serum by expression and drying takes very much longer.

In coagulation, too, particle size, shape, and distribution are important. A very dense coagulum with narrow capillaries can be achieved by the slow coagulation of a latex having a wide distribution of particles. By rapid coagulation, especially at low temperature, a looser coagulum is formed because the particles do not have time to find the optimum positions for tight packing.

The author applies these conceptions to the gelling of a latex foam and especially discusses the incidence of surface- and of below-the-surface-holes and tears due to foam breakdown caused by the size and shape characteristics of the latex particles.

In a section entitled 'Technological Significance of Particle Size Distribution,' he has wise things to say about the limiting proportions of large- and small-particled latices for achieving desired properties and kinds of products.

This discussion has occupied just over two pages. The remainder of the paper, some five pages, is concerned entirely with and entitled Latex Rheology, which in practice means viscosity, for the measurement of which he distinguishes three main types of instrument: 1. Falling-ball Viscometer. 2. Orifice or Capillary Viscometer, and 3, Shear or Rotation Viscometer. In the last class he refers to a dozen different kinds of apparatus, including Couette, Searle, Epprecht, Brookfield, Ferranti, Mooney, Brabender, etc., none of which is ideal, though for practical latex technology, especially latex foam work, the dynamic viscosity is the most useful measurement.

Latex Viscosity

The rheological properties of latices are influenced by:

1. The serum proteins.
2. Globulides of the rubber fraction.
3. Serum substances of low molecular size.
4. Temperature-dependence of the Brownian Move-

COMMENT ON SCIENTIFIC AND INDUSTRIAL MATTERS

by **F. C. JENNINGS**

ment of the particles. It is difficult to separate their effects.

Useful curves are given showing the relationship between temperature and viscosity for Revertex and three types of SBR latex at various concentrations, and another chart shows the effect on viscosity of a number of thickeners. Results and graphs depict the viscosity-temperature relationships of a variety of dispersions and latex mixes, from which several interesting technical conclusions can be drawn, such as the best temperature for making sulphur dispersions.

This is an excellent paper, reporting much new work and advancing several promising theories well worth discussion by latex technologists. Further parts will be awaited with interest.

The Crystal Ball

Of the many subjects discussed here, one of the most common, appearing continually in many guises and aspects, is planning for the future, the technological future. I frequently insist that we must learn to think along new lines because we are entering the age of plenty with techniques better adapted to the passing age of scarcity.

Cheap Power Ahead

Fuel supplies at reasonable prices are basic to industry. I want to draw attention to some pertinent remarks by Georg Tugenhadt in the *Observer* of October 16. Entitled 'Cheap Power Ahead,' it begins: 'The central fact of our energy policy for the 1960s is the prospect of a surplus of energy supplies for as far ahead as we can see. We can now confidently plan for surplus. . . .' He goes on to claim that this is due less to the prospects from nuclear energy than from the outlook for oil supplies.

I am not here concerned to take part in Tugenhadt's private quarrel with the Atomic Energy Authority over its predictions about future fuel costs, but I would like to extract some of his statements about future oil supplies because to us in the high-polymer industry, which is now so closely tied up with oil and likely to be increasingly so in the future, they have an added significance.

He speaks of 'the ever-growing potential of the oil and gas resources in nearly every part of the world,' and says that 'the possibilities of increased output from North Africa and from the new oilfields in Iran . . . are known to be gigantic' and 'the most important fact in this changed situation is the abundance of oil in Canada.'

'It is clear that so far only an infinitesimal fraction of them [the world's oil resources] have been recovered' and 'during recent years a fair amount of evidence has come to light which suggests that oil and natural gas are constantly being formed in the underground reservoirs of the world.' Improved recovery techniques are continually raising the estimates of available reserves. For instance, since the beginning of last year, the available reserves in the USA have been trebled by progress in recovery methods. Nor has such progress been made at the expense of higher costs and prices, in fact, the opposite is true.

All this is excellent news for our industry in which oil is a basic raw material used in ever-increasing proportions. Something may depend on Government policy for fuel as to whether we shall benefit as much as we might or as much as other countries will from the world trend in price reductions.

Nearer to Erewhon

Hard on the heels of the dream of the computer-controlled rubber factory (if, indeed, a dream can be said to have heels) which I discussed in these columns last week, is the news of the effects of the 1100 Emidec computer installed by Boots Pure Drug Co. at its Nottingham headquarters. This £200,000 instrument is intended to deal with the flow of orders on the central warehouse which stocks some 60,000 items. It will halve the clerical staff needed for this job, and a more important advantage will be the prompter and more precise control of stock levels.

As Hochschwender predicted for the rubber factory, Boots are now studying the possibilities of 'automatic warehousing' based on the idea that the computer could automatically control the sorting and packing of the items it calculates from its input of orders.

Computers encourage centralization and, in order to strike the right balance between this tendency and the manifest advantages of decentralization, managements must do some hard thinking if the computer's threat to take *them* over is to be resisted.

An Economist with An Idea

The chief problem of machinery, I keep saying, is to get rid of it when the technologist has invented something better, and this is a problem for the economist. I lay my pistol aside to applaud Andrew Shonfield, the Economic Editor of the *Observer*, whose new book, 'The Attack on World Poverty' (Chatto and Windus), deals with the question and makes a valuable suggestion. I hope I am not doing him an injustice in roughly summarizing one of his theses by saying that he suggests that obsolete or obsolescent machinery should be given away as aid to the underdeveloped countries.

There are difficulties, of course, mainly political, but as Shonfield says: 'What seems to be overlooked is that the object of the exercise is not to run a competition in self-sacrifice among the well-to-do nations, but to collect the maximum amount of useful things that the poor need and the rich are willing to spare.'

'Britain and other producers have spare capacity for making traditional types of electric power equipment which the underdeveloped countries need. Similar situations are certain to occur in a whole series of other industries during a period like the present when exceptionally rapid technological progress, as well as the frivolities of fashionable change in technical design, makes machines idle and ready for the scrap heap long before their useful life has been exhausted.'

Here, at last, is a long-looked-for contribution from the economist to technological progress. We must have more, and we must find the politicians who can implement them. But that is beyond the scope of 'Views and Reviews.'

CHARLES JENNINGS

MEN *and* MATTERS

A Review of People and Events

by Peter Richards

POLYMER Corporation, which is about to carry out a $40m. expansion — including a butyl rubber plant in the UK — recently celebrated its seventeenth anniversary.

Construction of the Sarnia plant began in June 1942, and within 15 months the rubber on which Canada's war machine was to roll began coming off the end of the production line. A $50m. gamble had paid off. The process was so new at that time and the urgency so great that the step to commercial production had to be made with only limited, semi-commercial experience.

Building of the plant was to continue into 1944, but in the remaining months of 1943, 5½m. lb. of rubber were produced. In 1944, while still under construction, the output reached 78m. lb.

The transition to peacetime conditions was strengthened greatly by a determined sales effort to put synthetic rubber into overseas markets. So successful was this campaign that more than two-thirds of Polymer's production now finds its way to foreign countries, and plant throughput has increased from the 1944 figure to an annual rate of approximately 350m. lb.— a four-fold increase. The new plants that are to be built in UK and France are a reflection of Polymer's concern about economic trends in Europe, and will give the company production footholds in the Free Trade Area and the Common Market. (See page 76.)

Keeping Holland Afloat

During part of the macroPlastic exhibition in Utrecht, a party of representatives of most of the European plastics trade journals were the guests of NV 't Raedthuys, the exhibition organizers. As well as visits to the exhibition the party went on a flying tour of Holland to see something of the thriving Dutch plastics industry. The tour included the plant of Algemene Kunstzijde Unie NV, manufacturers of Akulon, Staatsmijnen, who are making a wide range of materials from coal and oil and the Royal Dutch Shell Plastics Laboratories at Delft.

We were also taken on an aerial tour of the Delta Plan sites to see how plastics are helping the Dutch in their fight with the sea. Nylon mats are being used to form the base for the new dykes being built, instead of the hand-woven willow mats used previously, with a considerable saving in manpower and time.

I must admit that after nearly an hour of acrobatics over new dams, dykes, building pits and other engineering operations I rather lost interest in the proceedings and was very glad to reach terra firma again without losing anything else.

Whirlwind Sales Tour

Just to show how it can be done, H. V. Rowlands, sales director of Burtonwood Engineering, did a quick three-week tour of Europe, including Russia, recently, and brought back £126,000 of orders. (*RJIP* October 29, 722.)

His visit to the USSR, where he was accompanied by A. Anderton, electrical engineer, and J. Clare, sales engineer, was undertaken to promote the sale of plastics machinery manufactured at Burtonwood. 'We had a most encouraging trip,' Mr Rowlands said on his return. 'Not only did we secure orders for granulators, but there is every possibility of selling extruders and ancillary equipment.'

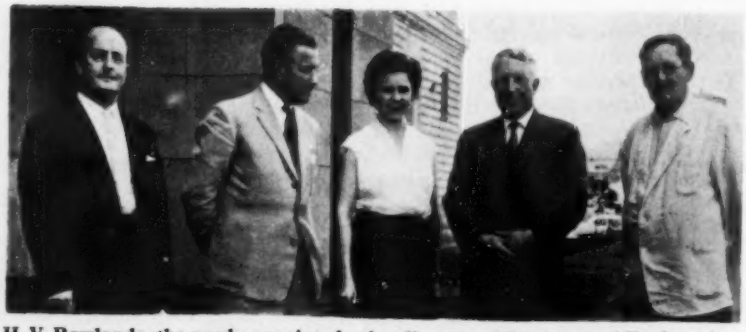
Turning his attention to the other side of the Iron Curtain, Mr Rowlands immediately set off on a tour of Italy, Holland and France, where he obtained substantial orders for plastics equipment from two large Italian chemical companies. From a Dutch chemical company, who are carrying out extensions to their synthetic rubber plant, he received orders to the value of £26,000 for supplying equipment which has not previously been built in the UK.

Since Burtonwood was acquired last year by US Industries, the firm has also had greater opportunities of exporting to USA. Orders received recently from the other side of the Atlantic include one for the manufacture of filter packs to be used on a new Terylene plant under construction in North Carolina, and another for a polythene plant under construction in Mexico.

Ad Nauseam

The Fresh Food Packaging Exhibition at Alexandra Palace certainly showed that plastics and modern packaging methods are going forward hand in hand. Among the exhibitors I noticed Anglo-American Plastics, British Sidac, British Visqueen, Cascelloid, Commercial Plastics, Lustroid, Metal Box, Microcell and Polymesh.

At the moment 7% of bacon is sold in packs and 20% of potatoes, while 25% of eggs are prepacked. A glance at figures quoted by J. P. Van den Bergh, president of the food manufacturers association, shows that the scope is immense. Opening the exhibition he said that the public spent some £4,900,000 a year on food. A family of three ate about 552lb. of potatoes in a year, 51lb. of cabbage, 29lb. of carrots, 61lb. of apples and



H. V. Rowlands, the newly appointed sales director of Burtonwood Engineering, recently returned from a tour of Russia and Western Europe with a well-filled order book. This picture, taken in Moscow, shows (*left to right*) A. Anderton (Burtonwood), H. V. Rowlands, a Russian interpreter, Mr. Smirnov (vice-president of Techmashimport) and Mr Egerov. (See Whirlwind Sales Tour)

Unique idea becomes successful product with PLIOLITE LATEX

Unique in concept and construction is the best way to describe the handsome floor covering pictured above. The idea is to use it first as temporary carpeting, later as permanent padding under conventional carpeting. It's made of colourful, durable open-weave cotton, permanently bonded to long-lasting foam rubber. The price—surprisingly low!

A vital part in turning this bright idea into a successful product was played by PLIOLITE LATEX 5352. This new styrene/butadiene rubber latex was chosen primarily because it can be used *without* blending with natural rubber latex to make resilient, durable foam. Other reasons for its selection: Outstanding uniformity. Excellent physical properties.

How can Pliolite Latex 5352 help you put your product out in front? You'll find it makes an excellent, economical cushioning for *many* products. For details see your Goodyear Chemical Distributor.

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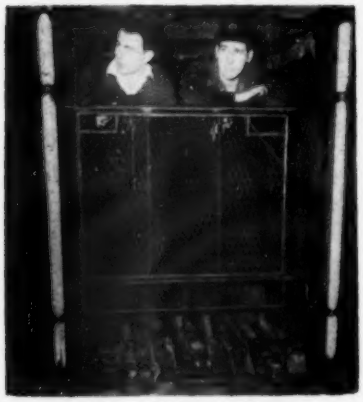
pears, 741 eggs and 176lb. of carcase meat. 'We all hope,' went on Mr Van den Bergh, 'that there will be scope for this small family to eat more.'

All I can say is that if they were presented with these figures then I am sure that, like me, they would only find scope for violent indigestion.

Vinyl Goes Underground

Plastics are usually on top of the world, but the other day I heard of an application where they went a little lower — down the mine, in fact.

At Chislet Colliery — one of Kent's four coal-mines — there are four two-



decker lifts, each deck capable of holding 18 men or one mine car, and they go down 1,500ft. The lifts are steadied by wire guide ropes, ¾in. diameter, which have to be kept covered with thick oil. But when the lift was in motion, the oil sprayed into the cages and on to the men.

The remedy was effective but simple. At each corner of the cage there was fitted a length of Marley vinyl rainwater pipe which enclosed the metal guide rope — and the splashing oil was confined to the inside of the pipe. Vinyl was chosen for being non-corrosive, maintenance-free and because metal pipes would have been liable to fray the ropes.

New Ingram Director

Mr H. R. Kalepp, who until recently was the works manager of the Tool and Mould division of Redland Engineering Ltd., at Hove, Sussex, has now been appointed a director of J. G. Ingram and Son Ltd.

H. R. KALEPP

This company is the nucleus of the Rubber and Plastics Division of the Redlands Holdings group of companies.

BTR Strengthen Marketing

Further steps have been taken in the reorganization on a divisional basis of BTR Industries activities, designed, I am told, to strengthen the sales and marketing operations of the group.

In the belting division: G. W. Williams becomes Southern area sales manager at head office, London, and G. E. Plows Northern area sales manager at the Manchester office.

In the general mechanicals division J. Etchells becomes divisional marketing manager, with P. M. Hartley as sales manager for transmission belting, vibro-insulators and other bonded rubber-to-metal products; F. T. Metherell as sales manager for general rubber and plastics products, and W. N. Evans as design services manager; H. N. Adams becomes Northern area manager at the Manchester office.

* * *

Mr J. Devlin, hon. secretary of the IRI's Leicester Section, reminds me that their popular dinner-dance, so successful in the past, will be held on November 14 at Leicester's Grand Hotel. Tickets, 32s. 6d. single, £3 double, may be had from Mr Devlin who is, of course, with the B.B. Chemical Co. Ltd., Ulverscroft Road, Leicester. For those who leave it late, his telephone number is Leicester 20175.

* * *

Perstorp Products (Great Britain) Ltd., selling agents in the UK for Swedish Perstorp decorative laminates, are using for their 1960-61 campaign full-colour pages in home and do-it-yourself magazines, and black-and-one-colour pages in the trade Press.

Question Corner — 142

(Second Series)

467. Give some further information on the extrusion of polythene sheeting?

(Answer next week)

Answer to Question Corner — 141

466. In flat film extrusion of polythene the melt is extruded through a 'T' type slot die downward into a quench water bath for quick cooling. Under a roller in the bath the cooled film is pulled through pinch rolls, the bead (thickening of the edges) is trimmed and the film wound up on a roll.

Some of the factors to be considered are:

(a) The distance from the die lip to the surface of the cooling bath must not be more than 1-3in. as too great an air gap results in excessive necking of the film web at the edges.

(b) The water in the cooling bath must be kept at a constant temperature as this has a pronounced effect on film properties. With extrusion temperatures constant, lower quench temperatures improve slip and anti-blocking, while higher quench temperatures result in a film easier to wind without wrinkles and with better physical properties.

(c) The screen pack is important because it helps control back pressure, compounding action and extruder output. The pack used for flat film extrusion is usually a heavy one.

(d) The polymer melt is forced into the slot die at its centre. By way of a manifold and over the lands at the lips it reaches the slot opening. The inside surface of the die, as well as the lands, must be precision-machined and well polished. The slightest surface irregularities will result in gauge variations, striations and weakened films.

The die lengths depends primarily on the extruder size and the desired film widths. It may range from 24 to 100in., or more. With increasing die length, extrusion operations become more critical. The resin must be more uniform, or the haul-off rate must be reduced.

(Another question next week)

Polly Ester Says . . .

'Caoutchouc — bovine spearmint'

Plastics in Hungary

LARGE-SCALE MANUFACTURE SCHEDULED

THE comparatively slow rate of consumption of plastics in Hungary has been mainly due to the shortage of domestically produced thermoplastic materials. The industry predicts 'a remarkable change' in the next few years.

Hungarian polyvinyl chloride production, scheduled to start with 6,000 tons per annum in 1963, is to be boosted to 16,000 tons by the end of the second Five Year Plan in 1965. During the same period a 10,000 ton capacity polythene factory will be completed. Even so the industry will still rely on considerable imports.

The Hungarian plastics industry has covered a lot of ground recently. In 1957 it produced 2.7 times as much and processed nearly 4 times as much as in 1950. The progress made since has likewise been considerable as regards both the quantity and the assortment of goods.

The greater part of plastics now produced in Hungary are thermosetting materials, which totalled 3,998 tons in 1957.

While smaller quantities of polymethylacrylates for injection moulding, silicone products, epoxy resins and polyamide tubes are being produced, other plastics are still acquired through imports.

The range of plastics goods for the consumer market is being considerably extended; the production of various component parts too — especially those applied in vehicles and in the manufacture of telecommunication equipment — shows a steady increase.

Recently Hungary has taken its first steps in substituting GRP sheet for moulded metal panels in vehicles.

Side by side with hard polyvinyl chloride tubes the production of light-weight smooth-surface polythene tubing is on the increase. These tubes are produced on up-to-date extruders installed at the Hungarian Plastics Factory.

X-ray analysis of synthetic fibres at the Hungarian Research Institute of the Plastics Industry

The Research Institute of the Organic Chemical and Plastics Industries has evolved the manufacturing processes for a number of plastics, among them of corrosion-resistant coatings for the products of the engineering industry.

Plastics sheets of different thicknesses — from plates to thin films — are also produced. Ready-made clothing of plastic foil enjoys great popularity both in domestic and in foreign markets. Sheets, pliable and rigid alike, are applied increasingly in the building and engineering industries. For example, the protective sheaths of belts, water tanks, the protective covers of the electric appliances in the Drilling Machine Factory are made of the soft 'Hungaria' foil, while various containers, vats and the acid-resistant linings of chemical equipment are made of hard PVC sheet.

The production of foamed plastics — hard and soft — is on the upgrade.

Plain or corrugated sheets or moulds are made of glass-fibre-reinforced polyester. The compressive and tensile strength properties are being utilized in Hungary for roofings, balcony railings and as structural material for exhibition pavilions or other smaller buildings.

Plastics are also extensively used in the country for electrical appliances, switchboards, switch bases and cable insulation, and their application for drip plates, cover plates, wings, packings, sewers and stair railings is rapidly spreading.

The large-scale manufacture of PVC powder — so far obtained entirely through imports — is scheduled to start in 1963 with the simultaneous large-scale production of phenolics, polyester contact resins, polyamide and epoxide resins, polymethylacrylates and silicones.

Testing a new grade of PVC sheet on a vacuum-forming machine in the Institute

The new synthetic-yarn plant installed in the Viscosa Factory at Nyergesujfalu, has started operation. To boost its output, an additional 3,300 tons per annum capacity plant is scheduled to begin production in 1965. Until then Hungarian textile industry will have to rely partly on imported synthetic yarn.

Welsh College Plastics

PAPERS ON PHENOLIC AND EPOXY RESINS

THE first meeting of a short course on some aspects of the chemistry of plastic materials was held at the Welsh College of Advanced Technology on October 13. A. H. Henson, head of the department of chemistry and biology, said that before the end of the course it may be possible for students to inspect the new polymer laboratories.

B. Ellis, senior lecturer at the college, gave the first lecture on polymers, natural, regenerated and synthetic — which was an introduction to the course as a whole. He dealt with the history of the polymeric concept, pointing out that it was only finally accepted about 30 years ago, mainly due to the programme of work carried out by H. Staudinger between 1920 and 1930. The chemistry of the preparation of plastic type derivatives from natural rubber was then discussed and the important applications of some of these materials referred to. In particular, the future prospects for the use of chlorinated rubber in paints, as adhesives and other industrial applications was emphasized.

Some problems relating to the relative reactivity of vinyl type monomers to free radical initiators and ionic catalysts were discussed. The high relative reactivity of styrene to free radical polymerization was shown to be due to the high resonance stabilization of the growing free radical chain end. Finally, the methods of preparing graft and block copolymers were outlined. Some of the properties of these materials were mentioned, and it was pointed out that in any industrial application the graft and block copolymers must be usable mixed with homopolymer molecules.

pH Influence

A lecture on phenolic resins was given by A. A. K. Whitehouse, chief chemist, Ferodo Ltd. He dealt with the general chemistry of resin formation by the interaction of phenol and formaldehyde, pointing out the controlling influence of the *p*H on both the rate and course of the reaction. In particular he discussed the use of mild alkalines, such as zinc oxide, in the preparation of 'high ortho' resins. These resins, in which the substituents were in the 2,6 positions, were useful, he said, for the preparation of quick curing moulding compositions, because the para position was much more highly reactive than the ortho.

The formation of chroman rings from quinone methiols in the resin and unsaturated compounds was discussed in relation to the preparation of modified drying oils for paints and the vulcanization of rubbers by phenolic resins. Finally, the reasons for the satisfactory application of phenolic resins as coatings for stellar probes was explained. The major problem with stellar probes, Mr Whitehouse pointed out, was associated with the very large amounts of heat generated on re-entering the earth's atmosphere. Phenolic resins had been found to be more suitable as coatings for these probes than ceramic materials. Reasons for this were explained by gas chromatographic analysis of the products of high temperature pyrolysis of these phenolic resins.

The third lecture, on epoxy resins, was given by Dr R. F. Webb, research director, Ciba (ARL) Ltd., who opened with the preparation of the more usual epoxy resins from Bisphenol A and epichlorohydrin. Other sources of epoxy resins were mentioned in some detail. In particular, the epoxidation of compounds containing double bonds via the peracetic acid route to acetic acid, was discussed. Other sources of epoxy resins were the reaction products of epichlorohydrin with 'tetra phenol,' aliphatic dihydroxy compounds and amines.

The reactions of amines and anhydrides in the hardening of epoxy resins were explained, and the effects of catalytic hardeners, such as boron trifluoride and hardener accelerators examined. Dr Webb then went on to the methods of 'tailoring' epoxy resins to particular applications, such as casting resins, moulding powders, surface coatings and adhesives.

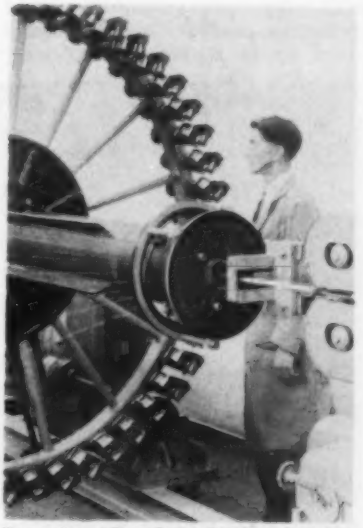
One application of epoxys that seemed somewhat unusual was the upgrading of tar or bitumen for use as a weatherproof roofing material, and also in road construction. Dr Webb answered several searching questions after his lecture, illustrating further the versatility of epoxy resins.

Mr G. F. E. Snell has been appointed to the Board of Bukit Pulai Rubber Estate.

Hose Reinforcement

NEW EQUIPMENT FROM CARTER

B. and F. Carter and Co., who have for many years been manufacturing machines for the reinforcement of high pressure hose, have now developed equipment for the making up of hose and the reinforcing of it by braided covers, using multi ends of high tensile steel wire. This type of reinforcement has been developed, the company says, due to the ever-increasing demand for higher pressures.



Carter's 'Pre-Spiroflex' machine, showing the final ring of wire bobbins, the die and die plate

The 'Pre-Spiroflex' machine has been designed and developed to apply multi layers of copper coated, high tensile steel wires in side by side spiral layers. Results so far show that bursting pressures 50% higher can be achieved. Flexibility is said to be superior to other types of manufacture and 'Pre-Spiroflex' hose can be subjected to double the normal impulse test period without any apparent ill effect.

The layer friction is claimed to be considerably less during flexing, resulting in a longer working life.

Offset on Tapered Bottles

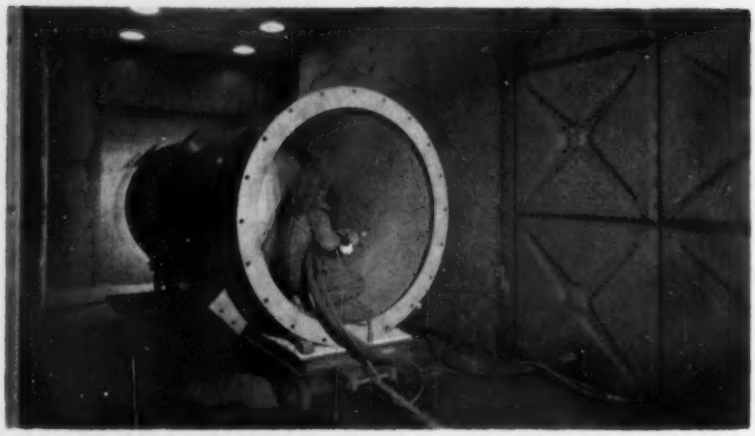
What is said to be a major technical advance by the plastics group of Metal Box now makes it possible to reproduce a design in multicolour offset printing on tapered polythene bottles.

Offset is the cheapest and most effective way of printing plastic bottles, but up till now has been confined to cylindrical shapes.

New Coating Plant

EQUIPMENT UP TO 5 TONS TREATED

A NEW industrial service, providing application of a comprehensive range of anti-corrosion and protective coatings to heavy equipment up to 5 tons, under factory conditions, has been established in Manchester.



Surface preparation at the new plant. This shot-blasting cabinet—one of the biggest in the UK—will accommodate work up to 30ft. x 12ft. x 12ft.

It is run by West's-Loyne Ltd., a company jointly formed by WGI Ltd. (West's Group of Industries), and Loyne Ltd., protective coating specialists.

Among the coatings applied are: epoxy resins (for the lining of vessels containing food, oil or chemicals); phenolics (water and acid resistant); synthetic rubber (abrasion resistance and corrosion prevention); PTFE (non-stick dispersion coatings for a variety of uses in industrial and domestic equipment); PTFCE (insulation and resistant to high temperatures and corrosive gases and acids) and silicones (non-stick, heat and chemical resistant).

The gas-fired oven at the plant is 30ft. long, 12ft. wide and 10ft. high, and is designed for sintering PTFE and PTFCE and for stoving high-bake epoxy, phenolic and silicone coatings. A temperature of 450°C. can be attained for heat treatment of metal if this is required before PTFE coating. Provision is also made for curing coatings by hot air and infra-red heaters.

Other facilities available at the plant include the shot blasting of very large vessels in the open with mineral grit and if required work can be prepared by flame cleaning and power wire brushing.

Pipes and ducting can be internally coated by spray or flow coating. Other types of application are by spray, brush and trowel.

Resin Down

Leicester Lovell and Co. has reduced the price of certain of its resins. All liquid and solid 'Epophen' epoxide resins have been cut by 1s. per lb. on all quantities, effective from October 1. Similar reductions have been made in the prices of 'Epophen' hardeners.

Federation Open Meeting

TRANSPORT COMMITTEE

Guest speaker at the annual open meeting of the Transport Committee of the Federation of British Rubber and Allied Manufacturers on Thursday November 17 is to be Mr A. R. Butt of Morris Transport Co. Ltd., Sutton Coldfield, Warwickshire.

Mr Butt, it is understood, has an extensive knowledge of local, middle and long distance haulage and will be competent and prepared to answer questions from the floor on all matters connected with the carriage of goods by road, such as goods in transit insurance, costing, loading and unloading bans and so on. Full particulars of the meeting which is to take place at the Café Royal, London, at 2.30 p.m., will be sent to companies in the industry within the next few days.

High Voltage Switchgear

PI NW SECTION

'SOME Applications of Plastics in High Voltage Switchgear,' was the paper given by T. R. Manley and K. Rothwell of A. Reyrolle and Co. Ltd., at a meeting of the North West section of the Plastics Institute held recently in Manchester.

Mr Manley outlined the resin systems, both epoxy and polyester type, used for different types of processes. For casting applications a fairly high molecular weight epoxy was used, he indicated, usually mixed with a filler such as silica or hydrated alumina. Anhydride curing agents may be used and a pot life of one hour was usual.

Correct choice of anhydride could increase the heat distortion temperature, e.g. pyromellitic dianhydride. The contraction of the resin during curing could cause cracking round metal inserts where adhesion was strong. This could be minimized by coating the inserts with silicone or wrapping with PVC tapes, before casting.

The strain in unfilled systems could be examined under polarized light.

A typical impregnating resin system was a lower molecular weight epoxy (fluid at room temperature) with hexahydrophthalic anhydride or methyl nadic anhydride as curing agent. This system gave a long pot life, important for impregnating purposes. Amine hardeners may be used, the high exotherm being acceptable in this case, but not in castings.

Systems of polyester and epoxy resins reinforced with glass fibre were discussed under different processes, for example matched die moulding, wound fibre under tension followed by resin coating and curing, and the dough moulding process.

Points that came out during the subsequent discussion were that flame-proof plasticizers were not used because there would be some decrease in the electrical properties of the system; nylon 6 could be economically used for turbolators, polypropylene was technically unsuitable since oil immersion at 90°C. was involved; asbestos had not been used as reinforcing agent in insulators because it absorbed moisture to a certain extent and both electrical and tensile properties would be reduced.

One member pointed out that the cracking of epoxy castings could be avoided by using long chain glycols, asked what the disadvantages were, and was told that the heat distortion temperature was decreased.

Rubber and Sport

IRI MERSEYSIDE MEETING

'RUBBER in the World of Sport,' was the title of the paper given by S. G. Ball, at the annual joint meeting of the Merseyside Section of the Institution of the Rubber Industry with Liverpool Technical Library. This was not only the first paper on sport to be given by the IRI in Liverpool, but also the first lecture held in the new library building. In support, an exhibition of sporting equipment and literature was displayed.

Mr Ball commenced his lecture by reviewing the many games that do or do not use rubber, and pointed out the reason why rubber was not used more widely in all games was because the games themselves, in the majority of cases, had been flourishing for hundreds of years, whereas rubber had a comparatively short history. Once a game had become established there was naturally a strong resistance to change.

The acceptance of rubber was therefore possible if used to give some advantage with little or no change in any characteristics, for example, the introduction of a rubber bladder into a football, if a new game came into being such as lawn tennis and squash, or if it displaced a definitely inferior, expensive, or unsatisfactory article such as the earlier feather-filled leather golf balls or even the solid gutta percha ball.

The lecturer dealt in some detail with the characteristics demanded of rubber in footballs, squash, tennis and golf balls, and with the use of films, slides and demonstrations explained the action of spin on games balls.

Summarizing his paper, Mr Ball said that rubber had found an important place in the field of sport — and filled it successfully. The games in which rubber was used were growing in popularity at the greatest rate. The amount of rubber used in sports was not large by commercial standards, amounting to perhaps some 10,000–20,000 tons a year out of a total consumption of 3m. tons. But the contribution it made to the enjoyment of the whole world with its 25m. tennis balls and 70m. golf balls, and still more millions of footballs, to mention only a few applications, must rank as of great importance. As more and more people had more and more leisure, rubber would undoubtedly play a still greater part in the enjoyment of this leisure.

Miss N. Dale and Mr H. H. Rieck have been appointed to the Board of Pandang Langkat Rubber Estates. Mr C. P. Choularton and Mr D. Blank have resigned from the Board.

At the IRI Merseyside meeting *(above, left to right)*: **F. W. Ball, Mr and Mrs S. G. Ball, G. H. Perkins and J. D. Crabbe. In the other picture D. A. N. Osborne and S. G. Ball are demonstrating the action of spin on a tennis ball**

PLANTATION AMALGAMATION

Continued from page 762

would be increased to £3,508,652, which would make it one of the largest rubber plantation companies. Existing shares of Kuala Lumpur are quoted on the Stock Exchanges in London, Glasgow and Liverpool, and on the Paris and Antwerp Bourses.

The enlarged company would have a much bigger interest in rubber production as it would control over 74,000 planted acres of rubber in Malaya of which 58% is planted with pedigree stock. In addition it will control 6,779 planted acres of rubber in Sumatra of which 70% is planted with pedigree stock. There will also be interests in Nigeria representing an area of pedigree rubber of over 2,000 acres; a total of 82,779 acres. Total estimated production of the Malayan estates for the 12 months to September 30 1961, is approximately 36m. lb.

Montopore Plant on Stream

A new plant producing Montopore expandable polystyrene beads — the raw material from which foamed polystyrene is made — came into production on November 1 at the Newport, Monmouthshire, factory of Monsanto Chemicals Ltd. Additional units will go on stream in 1961.

Concurrent with this, price reductions for the three grades of material available — standard, fire retardant and oil and petrol resistant — were announced.

The reductions vary according to quantity ordered. For example, the 100 ton price of Montopore P — standard grade has been reduced from 3s. 7d. a lb. to 3s. 3½d. a lb., and the price of Montopore F — fire retardant grade — has fallen from 4s. 1d. a lb. to 3s. 8½d. a lb.

The company says that the lightweight foamed polystyrene board made from Montopore is 'in great and rapidly growing demand for a wide range of thermal insulation purposes.'

Laminates in Harmony

A new laminating technique is claimed by Fablon Ltd. This is said to enable two or more decorative laminated patterns to be incorporated in a single sheet of material. Used in furniture and for wall panelling, this harmony range of Fablonite designs gives the effect of good inlays and veneers.

IRI NEWS

Southern Section

THE COLOURING OF RUBBER

THE Southern Section of the IRI held the first meeting of its 1960-1 programme at Southampton on October 12.

The chairman, R. J. Williamson, introduced C. Musgrave of Geigy, who spoke on 'The Colouring of Rubber.' It was an informed and informative talk to an appreciative audience.

Mr Musgrave outlined the various classes of pigments, their chemical constitutions, their characteristics and behaviour in rubber compounds, and concluded with some practical hints and suggestions on how to select pigments and process them.

There was still a place for inorganic pigments, he said, although compared with organic pigments they were often weak and flat, and more sensitive to acids and alkalis, they were generally more permanent to light and heat, and insoluble in hydrocarbon solvents. The organic pigments were usually stronger in tinctorial power and less likely to be attacked by acids and bases, but had to be carefully tested for heat- and solvent-resistance. In practice, the really useful inorganic pigments were the iron compounds (yellows to browns), chrome green, and the ultramarines.

The organic pigments were much more important to the rubber industry. Mono-azo compounds (such as toluidine red) were widely used but tended to dissolve inorganic solvents and to break down at temperatures over about 160°C. The diazo compounds being larger molecules, were much less susceptible and, in fact, presented no real curing temperature difficulties.

The 'metal toners,' which were frequently but incorrectly called 'lakes,' were metal salts (often calcium or barium) of sulphonated azo compounds and good pigments but largely confined to yellows and reds. Related to them were the chelated compounds like phthalocyanine blue, a copper compound, which, provided it had no free copper impurity, was quite safe in rubber. When price allowed, the very fast vat dyes were used.

Mr Musgrave stressed the desirability of testing any pigment in the intended mix processed in the projected manner and under the conditions of use it was likely to meet, because such properties as 'staining' were dependent on all these factors, being fundamentally a phenomenon of crystallization from solution induced by various influences. Other forms of staining could arise from unsuspected chemical reactions, for example, with the mould metal or the dusting powder.

The relationship between light stability and pigment concentration was not linear though it was likely that degree of pigmentation was linearly related to light stability. Below the minimum concentration needed to ensure the usually-specified figure, the light fastness fell off rapidly. Hence, it was necessary to check very carefully any blend of colours.

Discussing titanium dioxide, Mr Musgrave said that there was little difference between anatase and rutile if they were compared at equal opacity.

Questions — which the lecturer answered fully and competently — concerned toxicity, blending, UV absorbers, and pigment masterbatches.—F. C. J.

London Section

YOUNG PEOPLE'S CHRISTMAS LECTURE

THE London Section of the Institution of the Rubber Industry will hold a lecture for juniors between the ages of 14-18 years on Friday January 6 1961, at the Institution of Electrical Engineers, Savoy Place, W.C.2.

The lecture will be presented by Dr L. Mullins (NRPRA) who will speak on 'Rubber—A Story of Science and Discovery,' accompanied by many illustrations and experiments.

In order to accommodate as many juniors as possible, the lecture will be given twice — the morning session starting at 10.30 a.m. and the afternoon session at 2.30 p.m.

Early application for tickets is advised to Institution of the Rubber Industry, 4 Kensington Palace Gardens, London, W.8, marking envelopes clearly with 'Christmas Lecture.'

ELASTOMERS IN AUTOMOBILE APPLICATIONS

AS part of the winter programme of the London Section of the IRI, a Panel Discussion is to be held on 'Competitive Elastomers in Automobile Applications,' at which speakers representing natural rubber, synthetic rubber and user interests will answer questions put to them by members. The discussion will take place at 7 p.m. on Tuesday December 13 1960 at the Royal Overseas League, Park Place, St. James's, S.W.1.

Both technical and economic questions will be welcomed, on any aspects of the subject *excluding* tyres and upholstery. They should be worded as briefly as possible consistent with clarity and should be concerned specifically with competitive aspects of the available materials. In order to assist members of the panel in making considered replies, it is proposed that the questions be circulated to them before the meeting, although supplementary questions may be allowed.

Fabian at the Midland Section

The former Detective Superintendent Fabian of Scotland Yard was the speaker at the Institution of the Rubber Industry's Midland section dinner and social evening on October 21. This was the opening of the session, and was held at the New George Hotel, Walsall.

The well-known radio and television personality gave entertaining incidents from a life time of police service. This attraction swelled the numbers attending from the customary 50 or 60 to over 100.

The chairman of the section, Harry Leigh-Dugmore, presided, and welcomed many guests, including a notable overseas contingent — R. G. Seaman of the *Rubber World*, L. J. Halpin, chairman of the Buffalo section of the rubber division of the ACS, Mr and Mrs J. A. Carr, of Toronto, and Herr R. Schön of Hanau.—G. A. S.

Mr A. S. Hoffman and Mr S. E. Atter have been appointed directors of Ratanui Rubber.

PLASTICS PROCESSING CONGRESS

Continued from page 765

during their stay in the processing apparatus, *e.g.* by means of a dry gas, these variations did not occur.

It followed that the processing machines should be adapted in such a way that chips of constant moisture content were obtained.

Acrylic Processing

Processing of acrylic polymers was the title of a lecture by Dr D. K. Baird of Imperial Chemical Industries Ltd.

Polymethylmethacrylate, he said, had been available in the form of moulding powder since its development in the early 1930s; in recent years its usage had grown steadily and in parallel a better appreciation of the outstanding characteristics of this material.

An important advance in techniques for processing acrylic had been initiated with the availability, at attractive prices, of a polymer form of polymethylmethacrylate. This consisted of spheres of average diameter 0.004in., a form which was readily dry coloured by an efficient and inexpensive process in simple end over end tumbling equipment.

Acrylic polymer could be moulded satisfactorily on standard plunger type injection machines without an initial drying operation, though minor modifications to the power feed mechanism might be necessary. Preplasticizing machines, whether in line, single screw or twin screw type, were particularly suited to the moulding of acrylic polymer, allowing more direct control of the pressure on the material in the mould and efficient dispersion of colour. Intensive development of these techniques had led to the production of outstanding examples of the moulders' art, including large area tinted television implosion guards meeting the requirements of the latest International Electrotechnical Commission specification, the new British Post Office telephone, and disposable hypodermic syringes. The advent of acrylic polymer had led to a rapid development of techniques for the production of a wide variety of extruded sections by an efficient post forming technique, in conjunction with a simple tube die. The process required no initial drying of polymer, though vacuum extraction on the extruder was advantageous, and colours, including opal, were produced by the use of dry colouring on masterbatch techniques. In addition a pattern on all or part of the section could be produced by the use of an appropriately patterned roller, a technique which would extend the use of acrylic extrusions, particularly in the lighting field.

GRP Pipes

The influence of processing variables on the properties of glass reinforced plastic pipes was the title of a paper by F. W. Storm van Leeuwen of the Royal Dutch Shell Plastics Laboratory at Delft, who said that though thermoplastic pipes had various advantages over metal pipes they had only limited use at elevated temperatures and pressures. Reinforced thermosetting materials on the other hand maintained their strength at elevated temperatures and this factor, together with their excellent chemical resistance and favourable strength/weight ratio made them very suitable as pipe materials.

It was, however, well known that one of the greatest defects of pipes made from these materials was the 'weeping' phenomenon; that is to say leakage of liquid through micro-pores in the wall which occurred at pressures lying far below the bursting strength.

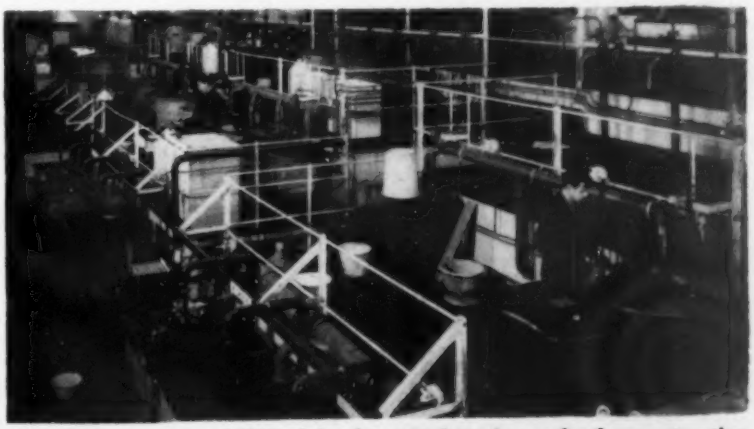
He discussed various factors which influenced the mechanical strength and the maximum allowable fluid pressure, which these pipes would withstand without any micro-porosity. Two inch glass reinforced plastic pipes had been made in the laboratory by winding fibre glass reinforcing material, impregnated with the appropriate resin, to the appropriate thickness around a heated mandrel.

Since the properties of resin and reinforcing material, the bonding strength between these two materials, and the distribution and orientation of the reinforcement played a great part in the ultimate properties of the pressure tube, these variables had been examined and tested. In theory, the axial stress from internal pressure in a pipe was one half the hoop stress and the pipes had been made in such a way that the strength of the pipe in the circumferential direction was about twice the strength in axial direction. In this way internal cracking of the resin, which was responsible for the permeability, was reduced to a minimum.

More flexible resins allowed greater deformations of the pipe-wall before cracking occurred but it was shown that the requirements for flexibility were opposed to those for higher strength and resistance against heat and corrosive chemicals.

The orientation and distribution of the reinforcing fibres, together with its bonding strength to the resin were shown to be related to the resistance against weeping, whereas chemical and heat resistance were entirely determined by the properties of the resin and curing agent. The outstanding properties of epoxy resins — their adhesive and mechanical strength and their chemical and heat resistance in comparison with polyester resins — made this material especially suitable for the construction of pipes.

Industrial Plastics (Pty.) Ltd., 4 Wessels Street, Braamfontein, Johannesburg, is a new company producing acid-resistant pumps in PVC and acid - resistant and fume - resistant pans. These are in all diameters from 4in. to 30in. and are finding a wide market in the chemical industry.



This complex system of PVC piping has now been in use for fume extraction for more than three years. Made of unplasticized PVC by Extrudex Ltd., it was installed by them at Johnson Matthey's platinum refinery at Royston. The ductwork extracts highly corrosive fumes from a succession of refining pans ; the fumes are then carried through PVC eliminator boxes and scrubbing towers

Future Events

IRI

Burton-on-Trent Section.—Nov. 7, at the Midland Hotel, 'Rubber as an Engineering Material.'

Leicester Section.—Nov. 14, at the Grand Hotel, annual dinner-dance.

London Section.—Nov. 8, at Manson House, Portland Place, 'Rubber in Engineering,' by P. B. Lindley (NRPRA).

Manchester Section.—Nov. 14, at the Engineers' Club, Albert Square, 'Determination of the Physical Properties of 5g. samples of Rubber,' by E. B. Storey (Polymer Corporation).

Midland Section.—Nov. 14, at Fort Dunlop, 'Factory Safety Organization,' by W. H. Webb (Goodyear Tyre and Rubber Co.).

North-Eastern Section.—Nov. 7, Film Evening at Eldon Grill, Newcastle.

Preston Section.—Nov. 14, at BTR Industries Social Club, 'Polymers for High Temperature Applications,' by D. A. W. Izod (RABRM).

Scottish Section.—Nov. 8, at Scottish Building Centre, Sauchiehall Street, 'The Uses of Rubber and Plastics in the Aircraft Industry,' by P. I. Brittain (De Havilland).

Southern Section.—Nov. 9, at Polygon Hotel, Southampton, 'Supply of Chemicals for the Rubber Industry,' by L. M. Dadson (I.C.I.).

South Wales and Monmouthshire Section.—Nov. 7, at Royal Hotel, Cardiff, 'Rubber Technology.'

PLASTICS INSTITUTE

South Wales and Monmouthshire Section.—Nov. 11. Annual dinner and dance at Saint Mellon County Club.

Southern Section.—Nov. 12. Visit to locomotive works, Eastleigh.

Western Section.—Nov. 9. 'Designing for Plastics,' by C. L. Child (I.C.I.) at Westinghouse Brake and Signal Co. Ltd., Chippenham.

Yorkshire Section.—Nov. 9. 'The Colouring of Plastics' by C. Musgrave (Geigy), at St. Mark's House, Woodside Lane, Leeds.

Midland Section.—Nov. 7, at the Grand Hotel, Leicester. 'The Contribution of Plastics to the Man-made Fibres Industry,' by A. Beecham (Courtaulds Ltd.).

North-Western Section.—Nov. 4, at the Textile Institute, Blackfriars Street, Manchester. 'Blow Moulding,' by D. B. Bowman (Metal Box Co. Ltd.).

Scottish Section.—Nov. 8, at the Scottish Building Centre, Glasgow. 'The Uses of Rubber and Plastics in the Aircraft Industry,' by P. I. Brittain (De Havilland Aircraft Co.). Joint meeting with IRI, Scottish Section.

South Wales and Monmouthshire Section.—Nov. 9, at Angel Hotel, Cardiff. 'Recent Developments in the use of Acetyl Resins,' by G. F. C. Barratt (Du Pont UK).

Plastics Statistics

SEPTEMBER EXPORTS AND IMPORTS

IN contrast to the previous month's fall, plastics materials exports rose in September. 14,056 tons were exported, compared with the 1959 figure of 12,924. (Values: £3,398,085 and £3,268,034.) These figures are given in the official Trade and Navigation accounts, which show that the biggest quantity was taken by Australia with 905 tons, followed by South Africa (887), New Zealand (818), Sweden (793), Denmark (666) and Western Germany (610).

Imports during the month were 6,340 tons valued at £1,997,587, compared with 4,286 tons and £1,692,075 in September 1959. Western Germany replaced USA as the major supplier selling 1,568 tons to the UK. USA sales totalled 1,478 tons; then came Canada and the Netherlands (about 420 tons each). Imports for this year now stand at 70,256 tons (£22,223,663); 1959 figures were 38,065 tons (£14,165,531).

Exports for the nine months of this year tot up to 128,830 tons (£32,577,096); 1959 figures were 113,134 tons (£28,606,036).

Details of imports of plastics materials during September 1960:

	Tons	£
Alkyd solid and liquid resins, solutions, emulsions and dispersions	226	45,722
Cellulose plastics:		
Photographic (including cinematograph) film base (except acetate butyrate)	150	196,774
All other	215	173,926
Polyvinyl chloride:		
Polymers and copolymers	2,113	302,156
All other	480	153,060
All other	3,156	1,125,949
Total	6,340	1,997,587

Exports of plastics materials during September 1960:

	Tons	£
Acrylic sheet, rod, tube, film, foil and profile shapes in primary form	597	352,785
Alkyd solid and liquid resins, solutions, emulsions and dispersions	352	63,372
Amin plastics:		
Solid and liquid resins, including solutions	1,036	128,694
Moulding and extrusion compounds	660	116,014
Cellulose plastics:		
Moulding and extrusion compounds	428	127,738
Sheet, rod, tube, film (excluding regenerated cellulose), foil and profile shapes in primary form	165	101,054
Phenolics and cresylics:		
Solid and liquid resins (straight and modified)	552	117,407
Other	428	148,914
Polystyrene	1,052	223,353
Polythene (polyethylene) sheet, rod, tube, film, foil and profile shapes in primary form	157	58,595
Polyvinyl chloride:		
Polymers and copolymers	1,526	209,092
Moulding and extrusion compounds	964	213,129
Sheet	480	222,116
Other	28	10,792
All other	4,960	1,240,792
Waste and scrap (including cellulold and film waste and scrap)	671	64,238
Total	14,056	3,398,085

UK exports to countries in the European Economic Community (Common Market) and the European Free Trade Association are shown below.

EXPORTS TO EEC

	Sept. 1959	Sept. 1960
Western Germany	736	610
Netherlands	498	434
Belgium	523	370
France	337	324
Italy	371	460
	2,465	2,198

Exports to Commonwealth countries during the month were 4,662 tons (3,698 in August 1959) and exports to all other foreign countries were 4,888 tons (4,702 tons).

EXPORTS TO EFTA

	Sept. 1959	Sept. 1960
Sweden	717	703
Norway	223	304
Denmark	469	666
Switzerland	268	189
Portugal	277	296
Austria	99	205
	2,053	2,363

(Any apparent discrepancies are due to rounding off of figures)

Rubber Statistics

MALAYA — CANADA — UNITED KINGDOM — UNITED STATES

MALAYAN shipments of sheet and crepe rubber in September totalled 77,421 tons as compared with 74,459 during August, according to official figures.

Of the September shipments, the UK took 9,187 tons, USA 5,582, West Germany 8,629, Japan 7,154, and the USSR 9,390.

The Commonwealth as a whole took 7,827 tons, Europe 22,080 and other countries 7,572.

Shipments of latex and revertex in the same month amounted to 8,045 as against 9,773 tons in August.

Of these September shipments, the UK took 2,034 tons, USA 766 tons, Japan 686, West Germany 1,378, other European states 2,253, the Commonwealth 541 and other countries 387.

Canada

Consumption of rubber of all types declined in Canada in August compared with same month last year, as well as in the period January-August.

Consumption of all rubber in August declined to 7,176 tons from 7,270 in the same month last year, bringing consumption in January-August period to 71,705 tons, a decrease of 8.1%.

Consumption of natural was smaller both in August and January-August period this year than last, while consumption of synthetic and reclaimed was larger on the month and smaller in the cumulative period.

The production of synthetic rubber in August amounted to 12,659 tons compared to 11,107 a year ago and in the eight months to 105,390 tons against 52,962 tons a year ago when Polymer Corp. was affected by a strike. Production of reclaimed in August amounted to 319 long tons, compared to 294 a year ago and in the eight months to 4,061 tons against 4,017 year previous.

United Kingdom

The following UK import and export figures for September have been issued by the Board of Trade (in tons):

	Sept., 1960	Sept., 1959
Imports (including synthetic and reclaimed) from:		
Nigeria	1,384	2,165
Singapore	3,957	5,837
Federation of Malaya	6,303	11,439
Ceylon	582	1,191
British North Borneo	153	463
Sarawak	1	15
Canada	1,894	1,023
Other Commonwealth Countries and Irish Republic	92	108
France	21	188
Burma	—	22
Vietnam	295	40
Indonesia	223	1,049
USA	2,481	1,972
Other foreign countries	1,044	1,121
Total	18,430	26,633
Rubber Latex	3,023	3,271
Other raw, including crepe	10,122	19,389
Balata	58	30
Synthetic Rubber	3,783	2,640
Others	1,444	1,303
Total	18,430	26,633
Exports (including synthetic and reclaimed) to:		
Commonwealth and Irish Republic	1,890	1,281
West Germany	288	260
Spain	627	165
USA	—	—
Other foreign countries	3,694	1,541
Total	6,499	3,247
Synthetic and reclaimed rubber	4,241	1,549
Waste or scrap of rubber, balata, gutta-percha and similar natural gums, etc.	2,258	1,698
Total	6,499	3,247

United States

Consumption of natural rubber (except latex) in September was placed at 32,520 tons against 33,361 in August while consumption of latex amounted to 4,250 tons against 3,897 in August.

Stocks of natural rubber at the end of September stood at 69,375 tons against 68,695 a month earlier, while latex stocks totalled 12,852 tons against 13,690 tons.

Reclaimed rubber production in September totalled 22,101 tons against 21,452 in August, and consumption of synthetic rubber amounted to 87,330 tons against 88,578 tons.

Production of synthetic rubber totalled 112,853 tons in September compared with 121,635 tons in August and synthetic rubber stocks stood at 242,959 tons compared with 242,740.

New Petrochemical Plants

The British Petroleum Company and California Chemical Company have announced a £7m. joint venture for the construction of two aromatics manufacturing plants. The undertaking will be known as BP California, and British Petroleum will operate the units on its behalf. The units will be located adjacent to existing BP refineries at the Isle of Grain, Kent, and Dinslaken, West Germany. California Chemical is a subsidiary of the Standard Oil Company of California.

In their initial phases the installations will produce 19,000 tons a year of orthoxylene, 16,000 tons of ethyl benzene, and 22,000 tons of paraxylene the basic ingredient used in manufacture of polyester synthetic fibres. The first production from the units is scheduled for late 1961.

Crop Returns

Unless otherwise indicated the figures quoted, to the nearest thousand lb., represent crop returns for the month stated and for the number of months of the planting company's financial year to date. Corresponding figures are given in parentheses.

August

RUBBER ESTATE AGENCY

Kuala Lumpur.—724 (700). 11 mths—7,192 (7,114).
Jeram.—315 (365). 11 mths — 3,417 (3,342).
Tamiang (Malaya).—71 (74). 11 mths—756 (805).
Sungei Kahang.—155 (159). 11 mths—1,709 (1,607).
Bandar Sumatra.—90 (95). 1 mth—90 (95).
Batu Kawan.—62 (68). 12 mths—730 (747).
Buntar.—123 (125). 8 mths—887 (845).
Kepitigalla.—87 (80). 5 mths—309 (264).
Langkat Sumatra.—67 (73). 8 mths—603 (579).
Sungei Bahru.—145 (134). 2 mths—281 (251).
Tambira.—106 (112). 2 mths—215 (216).
Tanjong Malim.—378 (405). 2 mths—725 (778).
Amalgamated Rubber.—28 (29). 8 mths—322 (282).
Java Rubber.—30 (33). 8 mths—655 (652).
Soember Ajoe.—20 (17). 11 mths—200 (269).

HARRISONS AND CROSFIELD

London Asiatic.—1,624 (1,606). 8 mths—12,385 (11,653).
Oriental.—321 (305). 8 mths—2,192 (1,966).
Bukit Kajang.—105 (—). 8 mths—851 (—).
Lanadron.—458 (521). 8 mths—3,358 (3,384).
Pataling.—1,406 (1,360). 10 mths—13,125 (11,971).
Jugra Land & Carey.—457 (530). 10 mths—4,411 (4,729).
Golden Hope.—731 (763). 6 mths—4,122 (4,231).
New Crocodile.—257 (253). 6 mths—1,369 (1,390).
Castlefield.—281 (271). 2 mths—576 (553).
Hallyrood.—96 (87). 8 mths—676 (570).
Hongkong.—35 (29). 8 mths—247 (216).
Hasette.—267 (240). 2 mths—548 (491).
Killinghall.—49 (47). 2 mths—96 (91).
Kuala Selangor.—74 (72). 8 mths—537 (505).
Kulai. — 184 (184). 10 mths — 1,782 (1,986).
Malaysia.—63 (52). 8 mths—463 (412).
Prang Besar.—355 (270). 5 mths—1,643 (1,261).
Sandac.—78 (91). 5 mths—348 (386).
Seaport.—88 (75). 2 mths—162 (140).
Malayaam.—735 (632). 5 mths—3,458 (2,622).
Lunuva.—121 (131). 8 mths—795 (816).
Lundon Sumatra Group.—2,604 (2,386). 5 mths—11,220 (10,400).
Asahan.—143 (99). 1 mth—144 (99).
Bah Lias.—187 (146). 10 mths—1,532 (1,484).
Central.—82 (69). 2 mths—153 (113).
Namee Tongan.—204 (263). 12 mths—2,767 (2,876).
Sialang. — 261 (205). 7 mths— 1,446 (1,314).
Tanah Datar.—90 (72). 8 mths—545 (532).
Bajee Kidoel.—223 (234). 5 mths—1,209 (1,282).
Djasinga.—92 (92). 2 mths—199 (202).

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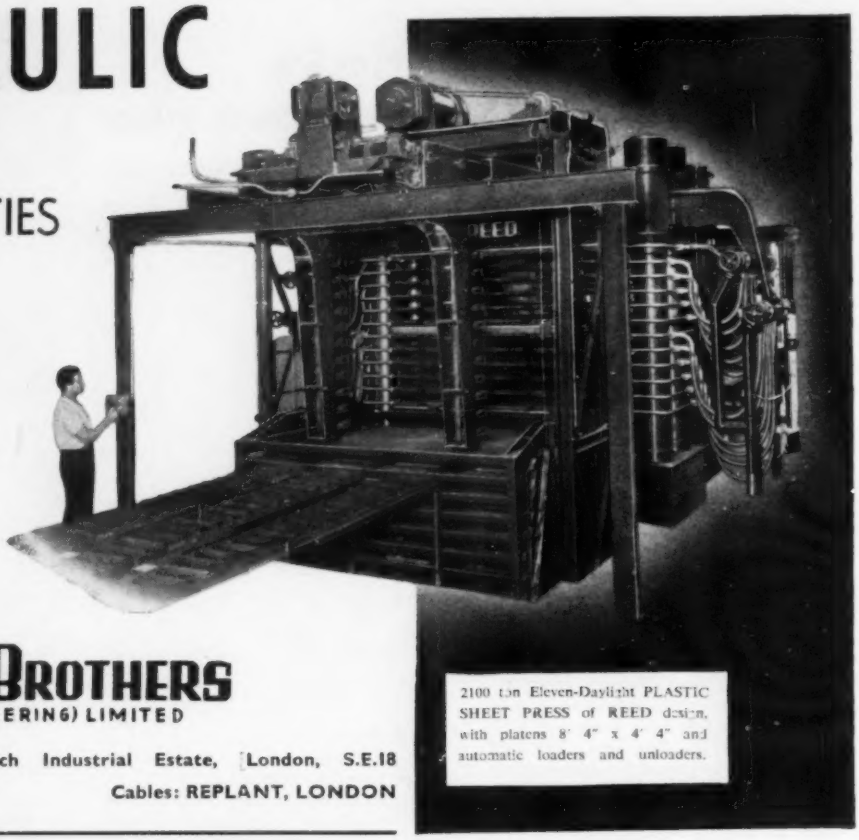

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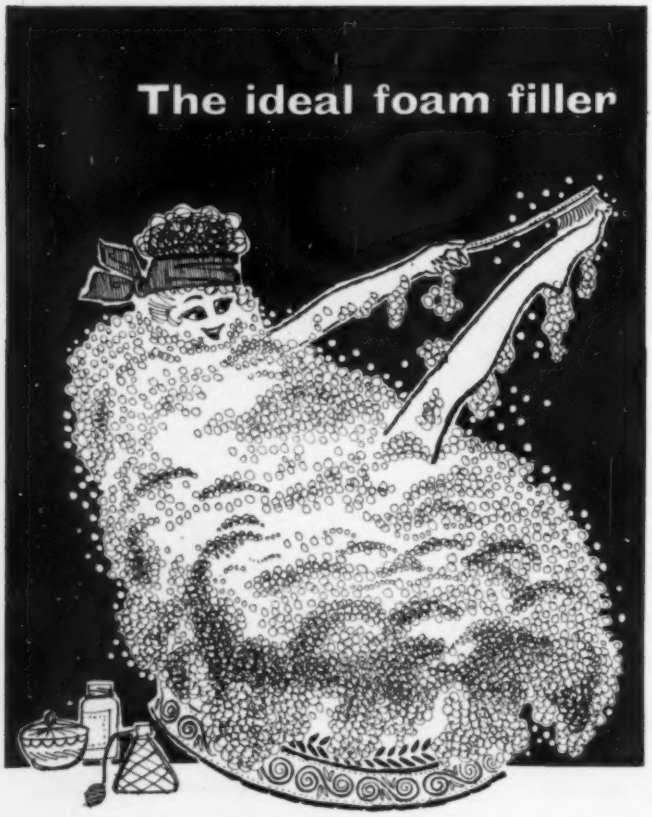

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PATENT SPECIFICATIONS

The following information is prepared from published Patent Specifications by permission of the Controller of H.M. Stationery Office. The full Specifications can be obtained from the Patent Office, 25 Southampton Buildings, W.C.2, at 3s. 6d. per copy (including postage).

Graft Polymers

Nos. 847,602-3. Monsanto Chemicals Ltd. Inventor: D. S. P. Roebuck. Application, March 19 1957. Filed, February 25 1958. Published, September 7 1960. No. 847,603 divided out of and addition to No. 847,602.

In the preparation of graft polymers, an aqueous dispersion of a polymer or copolymer obtained by emulsion polymerization of a vinyl compound is treated with a chemical polymerization catalyst such that active centres are induced in the trunk of the polymer or copolymer, and a monomer capable of radical-addition polymerization is then introduced to graft polymerize directly on to the active centres to form branches. No. 847,603 covers specifically the use of a Redox polymerization catalyst to induce active centres in the trunk of the polymer.

Examples given in No. 847,602 relate to (a) polymerization of styrene on to a styrene-butadiene copolymer; (b) polymerization of butadiene on to a styrene-butadiene copolymer; (c) polymerization of a mixture of styrene and butadiene on to a styrene-butadiene copolymer; and (d) polymerizaaion of styrene on to a styrene-methyl methacrylate copolymer. The one example given in No. 847,603 relates to the polymerization of styrene on to a styrene-butadiene copolymer. All the styrene-butadiene copolymers used in the examples were of high-styrene content being obtained by emulsion polymerization of a mixture of styrene 85 parts and butadiene 15 parts.

Stabilization of Polymers

No. 848,354. E. I. du Pont de Nemours and Co. Application and Filed, September 27 1957. Application in USA, September 28 1956. Published, September 14 1960.

PVC, polythene, polymerized vinyl esters, polybutadiene and other polymers are stabilized against ultraviolet light degradation by the addition of polymers containing salicylate units. The salicylate polymers may have their salicylate groups partly or wholly present in the form of chelates with polyvalent metals. Appreciable prevention of ultraviolet light damage is in general realized when the mixture of polymer and stabilizer contains 0.5% of its total weight of salicylate units, although preferably the composition contains 1 to 10% of its total weight of salicylate units. The salicylate polymers may be homopolymers of vinyl salicylate or allyl salicylate but are preferably copolymers of these monomers with another vinyl monomer. In examples, (1) a methyl acrylate-vinyl salicylate copolymer was used as a stabilizer for (a) a vinyl chloride-vinyl acetate copolymer and (b) a chlorinated ethylene polymer containing sulphonyl chloride groups; (2) an ethylene-vinyl salicylate copolymer was used as a stabilizer for polythene.

Presses for Textile Articles

No. 848,662. Isaac Braithwaite and Son (Drysalters) Ltd., A. L. Smith and Dunlop Rubber Co. Ltd. Application, July 29 1955. Filed, October 29 1956. Published, September 21 1960.

A resilient pad for one of the platens of a steam-heated laundry or dry-cleaning press is formed from silicone foam rubber, the pad being subjected to pressure in the presence of heat until it attains a substantially constant thickness. The percentage by volume of silicone rubber in the silicone foam rubber is 10 to 20%, preferably 15 to 17%. A silicone foam rubber pad of this kind was used satisfactorily for six months in a steam-heated laundry press whereas a conventional pad of cotton padding had to be replaced after a month's use.

Shorter Abstracts

Ethylene Polymerization. 845,683. Imperial Chemical Industries Ltd. Filed, May 6 1959. — New peroxy initiators for polymerization of ethylene at high pressure and relatively high temperatures.

Polymerization of Isoprene. 845,200. Phillips Petroleum Co. Filed, October 17 1955.—Cis-1,4, polymer of isoprene prepared in the presence of a catalyst consisting of a trialkyl compound of titanium tetrachloride.

New Oversea Standards

New oversea standards added to the BSI library include:

Standards Association of Australia: Amdt. 2 to SAA, Approval and test specification C 116-1955 Ap, Rubber insulated cables and flexible cords. Amdt. 2 to SAA, Approval and test specification C 147-55 Ap, PVC insulated cables and flexible cords.

Poland: P-81320, Polyamide yarn. P-81890, Asbestos yarn: grading.

Spain: 53 094, Plastics: measurement of absolute kinematic viscosity of polymer solutions. 53 095, Plastics: determination of migration of plasticizers. 53 098, Determination of melt flow index of polythene and polythene compounds. 53 099, Methods of test for cellulose acetate. 53 100, Determination of viscosity number of vinyl chloride resin solutions. 53 101, Quality standard for alpha-cellulose filled melamine tableware. 53 102, Plastics: determination of longitudinal electric strength of solid insulating materials at standard frequencies. 53 104, Plastics: determination of colour fastness to light. 53 511, Determination of compression set of vulcanized rubber. 53 515, Determination of hardness of vulcanized rubber.

Available to members on loan from: British Standard Institution, 2 Park Street, London, W.1. Copies available for sale from the Sales Branch.

US Rubber's New President

Mr George R. Vila has been elected president and chief operating officer of the United States Rubber Company by the board of directors. Mr Vila succeeds Mr John W. McGovern. He was formerly a vice-president and general manager of the Naugatuck Chemical Division.

Polyester Technology

ARTRITE/MIDLAND MEETING

SOME new aspects of polyester technology were dealt with at a meeting organized in Birmingham by Artrite Resins Limited recently. About 60 people from the Midlands plastics industry attended and, after an introduction by Dr G. Ader, saw a film showing the stringent testing carried out by Artrite on all their resins. Various technicians described the functions which were being carried out, right down to the selection of fillers and pigments for colouring, particular care being taken on their weatherability properties.

In the field of lay-up resins the company claimed great improvements in the hardening rate with their new range of LU 400 resins which are to be marketed shortly. The problems and advantages of spray moulding techniques were fully described and discussed whilst the various equipments available were shown. The relative costings of producing an article by three methods were compared, together with the cost of the capital equipment involved.

The marketing manager, Mr Harriman, explored the future prospects for this section of the industry, and in particular mentioned opportunities in the vehicle, ship, small craft and machine guard field.

Rubber and Plastics Stock Market

A REVIEW OF PRICES AND TRENDS

THE big deal or take-overs by mutual consent. Sounds like the title of some major feature film but in fact refers to the stock market over the past few weeks. For wedding bells, when we think back, never seem to have stopped ringing as one industry after another has posted its banns. They have ranged from wool, textiles, properties, television and radio. Even plastics have been involved under the £25 million get-together announced by the Southend firm of E. K. COLE AND PYE. All these dovetail efforts have been received well though in one or two instances they have, of course, been the cause of a great deal of surprise. For it is realized — not only in the City and investment circles but by the workers themselves — that it is now the trend of modern times. By joining forces two companies become obviously stronger both financially and production wise. Resources of many kinds are pooled for the common benefit and concerns are able to face the future with confidence.

The other big event which has occurred since we last appeared was the change in Bank Rate cut from 6% to 5½%. But having expected it for weeks the announcement came as something of an anti-climax. It's a long time since we can recall how the parish of Throgmorton Street took such important news so calmly. Perhaps it was because the downward move was due to external reasons and the Chancellor's earlier warning that this was not to be taken as a green light that the credit squeeze would be eased in other directions. So far it has not had any great effect on share prices although the tone has held steady enough and the buyers generally continue to have the upper hand. As always hope springs eternal in some people's minds. Already there are those who are prepared to wager on the next adjustment to 5%. And it is partly due to this kind of optimism that we feel the trend, if only gently, will go upwards over the near term.

AULT AND WIBORG pleased dealers with their decision to step up the half-time dividend from 5% to 6½% on the capital as increased by the acquisition of the Indestructible Paint group. The previous year's final was 20% on the present capital. Group profit before tax for the six-month period to September worked out at £501,856 against £341,017 for the same time a year ago.

HARRISONS AND CROSFIELD was another to get a warm reception. In this case the payment was increased from the equivalent of 12% to 15% with

Continued on page 787

Share Price Movements

Par Value	Company	1960 High	Low	Oct. 24	Latest
£1	A.E. Ind. Ord.	67/–	42/–	43/–	47/9
5/-	Albright & W. Ord.	31/9	25/9	28/6	27/9
£1	„ „ „ 5% Pref.	17/3	15/6	15/3	15/3
5/-	Anchor Chemical Ord.	18/7½	14/9	15/7½	16/–
5/-	Andersons Rub. Ord.	—	—	3/9	3/9
£1	Angus Geo. Ord.	60/6	34/9	60/3	60/6
5/-	Ault & Wiborg Ord.	27/–	20/–	25/–	26/9
£1	Avon India Rubber Ord.	46/6	35/–	35/6	35/–
£1	„ „ „ 6% Pref.	20/–	17/6	—	18/9
10/-	Bakelite Ord.	62/6	39/9	57/3	56/–
£1	„ 6% Pref.	19/3	16/9	19/–	19/–
£1	Baker Perkins Ord.	46/6	40/–	46/3	45/–
4/-	Bank Bdg. Rubber Ord.	4/3	2/3	2/6	2/6
4/-	Brammer H. Ord.	18/6	16/9	18/9	18/3
10/-	Bridge, David Ord.	66/6	53/6	65/6	63/9
5/-	Bright, John Ord.	18/6	15/3	17/–	16/3
5/-	Brit. Blting. & Asb. Ord.	—	—	19/6	19/6
£1	„ „ „ Pref.	—	—	17/3	17/3
2/-	Brit. Ind. Plas. Ord.	12/1½	5/3	9/10½	9/4½
2/-	„ 10% (tax free) Pref.	4/9	4/3	4/9	4/9
£1	British Xylonite Ord.	113/–	78/9	114/6	108/9
£1	„ „ 5% Pref.	18/9	14/–	14/6	14/6
£1	BICC Ord.	61/3	49/9	51/3	49/6
5/-	BTR Ind. Ord.	17/3	9/9	16/6	16/7½
£1	„ „ 7½% Pref.	24/3	23/–	21/3	21/3
5/-	Cole, E. K.	31/9	18/10½	29/–	24/9
£1	Courtaulds Ord.	59/4½	44/3xc	56/10½	57/–
£1	„ 5% 1st Pref.	17/9	16/3	15/9	15/9
£1	„ 6% 2nd Pref.	21/–	19/–	18/6	18/9
4/-	Cow, P. B. Ord.	9/6	6/9	9/–	8/6
£1	„ „ 5% Pref.	15/6	14/–	14/–	14/–
1/-	Dannimac Mfg. Ord.	14/6	9/–	12/10½	14/6
10/-	De La Rue Ord.	78/6	47/9	67/6	61/9
£1	„ „ „ 3½% Pref.	12/–	10/–	10/3	10/3
10/-	Distillers Co. Ord.	45/7½	32/9	43/7½	43/3
£1	„ „ 6% Pref.	22/–	19/6	20/–	20/–
£100	„ 5% Conv. Loan	£96	£95	£95	£95
£100	„ 5½% Unsec. Loan	£97	£87½	£86½	£87
10/-	Dunlop Rubber Ord.	30/6	21/9	24/6	22/9
£1	„ „ 5½% Pref.	19/–	16/6	16/6	16/6
£100	„ 3½% 1st Debs.	£78	£68	£69	£69
£100	„ 4½% 2nd Debs.	£87	£80	£79	£79½
£1	Eng. Elect. Ord.	53/6	32/–	32/6	35/6
4/-	Ebonite Cont. Ord.	14/3	11/–	11/–	10/9
£1	English China Clays Ord.	95/–	74/6	87/6	88/6
£1	Goodyear Tyre 4% Pref.	12/9	10/9	11/6	11/6
5/-	Greeff Chem. Ord.	35/–	23/6	25/–	25/6

Par Value	Company	1960 High	Low	Oct. 24	Latest
10/-	Greeff Chem. 5½% Pref.	9/–	8/6	8/–	8/–
5/-	Hackbridge Hldg.	8/7½	7/1½	15/4½	7/3xc
4/-	Greengate & Irwell Ord.	6/6	5/3	6/3	6/3
£1	Harrisons & Crosfield Dd.	64/–	49/6	53/9	52/6
1/-	Hunt & Moscrop Ord.	2/9	1/9	1/7½	1/7½
£1	Imp. Chem. Ord.	75/3	56/6	70/9	71/3
£1	„ „ 5% Pref.	18/–	16/3	16/3	16/3
£100	„ 4½% Unsec. Loan	£89½	£81	£82½	£82½
£100	„ 5½% Conv. Loan	£212½	£90xc	£92½	£92½
1/-	Kleemann (O. & M.) Ord.	11/6	8/3	10/1½	10/1½
£1	„ „ 6½% Pref.	19/–	17/–	17/6	17/6
5/-	Laporte Ind. Ord.	33/6	25/3	31/9	30/10½
£1	„ „ 7½% Pref.	24/3	23/3	23/3	23/3
£1	Leyland & Birm. Rubber Ord.	63/–	46/3	52/6	52/6
£1	„ „ „ 6% Pref.	19/–	17/6	18/9	18/9
2/-	London Rubber	14/9	11/–	13/3	13/9
£1	„ 6% Red. Cum. Pref.	20/–	18/9	18/9	18/9
£1	McKechnie Bros. Ord.	71/6	57/–	60/–	65/–
£1	„ „ 'A' Ord.	69/3	56/–	61/3	64/–
£1	„ „ 6% Cum. Pref.	18/–	16/–	17/–	17/–
5/-	Monsanto Chem. Ord.	28/–	23/3	30/9	30/9
£1	„ „ 3½% Pref.	12/9	12/–	12/6	12/6
£100	„ „ 6% Debs.	£103½	£98	£98	£98
5/-	Miles (H.G.) Holdgs. Ord.	11/3	9/9	10/–	10/–
£1	North British Rubber	21/3	16/–	16/3	16/3
5/-	Northwestern Rubber	—	—	12/–	12/–
5/-	Plastic Engines. Ord.	30/–	20/–	29/–	29/–
5/-	Redfern Holdings Ord.	5/9	4/–	4/–	4/–
2/-	RFD Ltd. Ord.	6/6	4/–	4/–	4/–
£1	„ „ 5½% Pref.	14/6	12/9	13/9	13/9
2/-	Rubber Imp. Ord.	7/9	4/–	4/–	4/–
2/-	„ „ 'A' Ord.	7/–	3/3	3/6	3/6
£1	„ „ 5% 1st Pref.	15/–	11/3	11/10½	11/10½
5/-	Rubber Reg. Ord.	19/3	17/–	18/6	18/6
4/-	Shaw Francis Ord.	27/6	21/3	21/6	20/6
2/-	Silentbloc Ord.	13/3	10/–	9/–	—
5/-	Storey Bros.	41/3	28/3	39/–	37/6
2/-	Sussex Rubber Ord.	2/3	1/3	2/–	2/–
5/-	Sutcliffe Speak Ord.	15/9	11/–	13/6	13/6
£1	Turner & Newall Ord.	60/10½	48/3	57/4½	55/–
£1	„ „ „ 7% Pref.	25/–	22/3	22/9	22/9
5/-	Universal Asbestos Ord.	50/–	25/–	24/3	25/6
5/-	Viscose Dev. Ord.	16/6	14/9	16/–	16/–
5/-	Warne W. (Holdgs.) Ord.	18/9	15/3xc	17/9	17/6

Rubber Markets

LONDON

Following further liquidation and easiness at Singapore the decline continued. The lower levels attracted a fair volume of short covering orders, but little new buying by consumers was noted. Switching from near to distant Terminal positions again featured trading. Differentials between the Terminal positions continued to narrow.

Latest prices are as follows:

No. 1 RSS Spot: 26⅝d.-26¾d.

Settlement House:

December 26⅝d.-26¾d.
January/March 26⅛d.-26¼d.
April/June 26⅛d.-26¼d.
July/September 26⅛d.-26¼d.
October/December 26⅛d.-26¼d.

No. 1 RSS cif basis ports:

November 26⅛d.-26¼d.
December 26⅛d.-26¼d.
January 26⅛d.-26¼d.

Godown:

November 88½ Straits cents nominal.

LATEX

Centrifuged 60% latex per gallon in drums, seller, November, 15s. 1d., cif European ports. Spot, seller, 15s. 8d. Bulk, seller, d.w. 14s. 11d. nominal. Creamed, seller, 14s. 9d. nominal, November. Normal, seller, November, 13s.

BANGKOK

No. 1 RSS

The price of No. 1 RSS at Bangkok on October 31 was 29.37½ (29.62½) US cents per lb.

DJAKARTA

Some ten tons of sheet No. 1 were sold in the morning session at 28.50 to 29 rupiahs per kilo on October 31. No transactions were reported in the afternoon.

	Rupiahs per kilo	
	Oct. 31	Previous
Spot No. 1 Priok ..	28.00b	28.75b
Spot No. 2 Priok ..	26.50b	27.25n
Spot No. 3 Priok ..	27.25n	26.00n
No. 1 fine pale crepe, spot	29.60n	29.50n

Tone: Steady, quiet

CEYLON

No. 1 RSS

The price of No. 1 RSS at Colombo on October 31 was 95 (95) Ceylon cents per lb.

SINGAPORE

Prices dropped in early dealings under up country and local selling on October 31. Shortcovering caused a slight rally but this did not last long and prices eased again in light trading which included some stoploss selling. Demand for lower sheet and offgrades was small and confined to covering of old sales to some continental destinations. Factories were disinterested. In the afternoon the market ruled very quiet and tended to sag.

	Malayan cents per lb., fob Malayan ports to open ports	
	Oct. 31	Prev. Close
No. 1 RSS, Nov. ..	88¼–88½	90½–90¾
Dec. ..	88⅞–89⅛	91⅛–91¼
No. 2 RSS, Nov. ..	87½–88¼	89¾–89⅞
No. 3 RSS, Nov. ..	87 –87½	89 –89⅜
No. 4 RSS, Nov. ..	83½–84¼	85½–86¼
No. 5 RSS, Nov. ..	78½–79¼	81¼–82
No. 1 RSS, Spot ..	87½–88¼	90 –90⅜
No. 3 blanket thick remilled crepe, Nov.	74 –75	76 –77
No. 1 fine pale crepe, Nov.	93¼–94½	94½–96
2x thin brown crepe, Nov.	72¾–73¾	74 –75

Tone: Easier

The Industries Syndicate quote latex, native produce, 60% centrifugal, packed in rectangular drums, fob at 173.60d. per gallon.

NEW YORK

The New York rubber market ruled as under on October 31:

DEALERS' PRICES

	US cents per lb., ex-dock	
	Oct. 31	Prev.
No. 1 RSS, Nov. ..	31⅞a	32⅛a
Dec. ..	31⅛–31⅜	31⅜a
No. 2 RSS, Nov. ..	31⅛a	32⅛a
Dec. ..	30⅞–31⅛	31⅜a
No. 3 RSS, Nov. ..	31⅛a	32a
Dec. ..	30⅞–30⅞	31⅛a
No. 1 RSS, Spot ..	32a	32⅜n
No. 3 amber blanket crepe, Jan. ..	26⅜a	27⅜n

FUTURES—REX CONTRACT

	Oct. 31	Prev. Close
Nov. ..	32.10b–32.20a	32.45b–32.60a
Jan. ..	31.06b–31.15a	31.55t
March ..	30.90b–31.00a	31.30b–31.40a
May ..	30.80b–30.90a	31.15b–31.27a
July ..	30.65b–30.75a	30.95b–31.10a
Sept. ..	30.40b–30.50a	30.80b–31.00a
Nov. ..	30.25b–30.40a	30.65b–30.90a

Sales: 179. Tone: Steady at decline.

Rubber futures were easy on October 31 following the decline at Singapore and London. Traders said the selling was scattered and a good part of the trading today consisted of switching operations. Physical rubber continued quiet. Futures were later in the day steady at the earlier decline. Physical rubber was slightly active in late dealings. The price trend was easier.

AMSTERDAM

The Amsterdam rubber market ruled as under on October 31:

No. 1 RMA	Guilders per kilo	
	Oct. 31	Previous
November	2.61	2.64
December	2.60	2.63
January	2.60	2.63
February	2.60	2.63
March	2.60	2.63
Jan./March	2.60	2.63

Sales: Nil. Tendency: Dull

STOCK MARKET

Continued from page 786

a final of 9½% plus a bonus of 2½%. Group trading profits were shown to have expanded from £1,313,161 to £1,607,191 and the net profit from £625,427 to £720,972. As to be expected both overseas taxes and UK charges rose steeply.

KUALA LUMPUR RUBBER has made offers for the capitals of five other rubber undertakings to effect a merger, as reported on page 762.

Terms offered by Kuala Lumpur are as follows:

Eleven Kuala Lumpur 2s. shares plus 2s. 6d. cash for every ten 2s. units in Kepong.

Eight K. L. shares for each Tanjong £1 share.

One K. L. share plus 3d. cash for each 2s. unit in Caledonian and in Glen Muar.

Two K. L. shares plus 7d. cash for each 2s. unit in Kuala Kangsar.

If any of the offers become unconditional Kuala Lumpur will pay on December 5 1960 an interim dividend in lieu of the final for the year to September 30 1960, amounting to 20% tax free. The Board of Tanjong proposes to pay on November 28 a second interim dividend in lieu of a final for the year ended June 30 1960, amounting to 8¾% tax free.

COMPANIES in the NEWS

Kepong (Malay)

Kepong (Malay) Rubber Estates Ltd. is to increase its investment in Latafoam Holdings Ltd., which has a small plant manufacturing polyester and polyether foams, the chairman, L. I. Simpson, announced at the annual general meeting.

During the year the whole of the company's crops continued to be marketed in the form of concentrated latex: the market for this had held up well.

'Although,' the chairman said, 'we do not believe that polyurethanes will completely displace natural foam rubber, we do believe that their use will increase sufficiently to replace foam rubber to a large extent. We have therefore decided to increase our investment in Latafoam.'

Trading profits amounted to £477,592 and a final dividend of 22½% was declared, making 30% for the year.

Peco

The Projectile and Engineering Company is increasing its interim dividend by 2% to 6% on account of 1960. A final of 11% made a 15% total for 1959.

The Board states that the interim is increased in view of the healthy state of the order book and the fact that — as forecast by the chairman last May — the current year has so far proved to be satisfactory, with profits ahead of last year.

Industry INTELLIGENCE

Technical Data

Rubber and Latex Seating

Polysar technical report No. 9:8B issued by Polymer (UK) Ltd., Walbrook House, Walbrook, London, E.C.4, gives recipes, processing details and properties of Polysar Krylene NS and Polysar latex 722 compounds for manufacture of rubber webbing and latex foam cushions for use in the upholstering of furniture.

The rubber webbing described was developed to have high modulus, tensile strength and elongation at break, low tension set, and good ageing properties. This is intended to be used without fabric reinforcement but fabric is sometimes incorporated to achieve special properties or to reduce cost.

The foam rubber recipe is based on a 25/75/20 ratio of natural latex/Polysar latex 722/clay filler which takes full advantage of the easy processing, good compression resistance and good ageing properties of the synthetic latex.

RF Heating

Technical Notes No. 214 recently issued by Ciba (ARL) Ltd., is the second part of an article on the general principles and methods used in radio-frequency or dielectric heating. The first half of this article was published in Technical Notes No. 213 (*RJIP* October 15 1960, p. 648). Subjects dealt with in the second part include the design of jigs and inductances for blue line heating, through heating and stray-field heating and the matching of generators and loads. Information is also given on the factors affecting the choice of glue for various applications. One of the fields where RF heating has been found very successful is in the setting of synthetic resin adhesives in the woodworking industry and it is towards users of the principle for this purpose that this article is primarily intended.

Foam Spray Guns

The introduction of low viscosity resins for rigid polyurethane foam production afforded the possibility of mixing the resin and isocyanate foam constituents without the assistance of a mechanical stirrer.

Spray guns incorporating this agitatorless mixing principle have been developed by I.C.I. Ltd., and are referred to as Mark V spray and dispensing guns. These are being manufactured under licence by British Tufting Machinery Ltd., Blackburn, and Viking Engineering Co., Salford, from whom further information may be obtained. The principles of design and operating routine of these guns are described in Technical Information Sheet Urethane PC/U.24, issued by the Polymer and Chemicals Service Department, Dyestuffs Division of I.C.I.

Machines, Materials and Equipment

Electromagnetic Valves

Electromagnetic valves manufactured by Concordia GmbH Stuttgart, are now being marketed in this country by Londex Ltd., 207 Anerley Road, S.E.20.

These valves are finding extensive use in automatic control of electrical, pneumatic and hydraulic systems and

a wide range of models is available. These include high speed operating models capable of 48,000 operations per hour, very fast opening and closing models, and reverse acting single way valves which can close against a pressure of 1,400 psi.

In some cases loss of head across a valve must be kept to a minimum, and for this purpose many valves are available having their internal part diameters equal to the internal pipe diameter.

Adjustable Filter

Filtration normally depends on the use of permeable media which are selected according to the size of particle to be filtered out. Now a filter has been designed in which the minimum size of particle which will be retained is determined by purely mechanical means, and set up on a calibrated control.

A precision conical male plug fits within a corresponding female housing, and can be moved axially a short distance by a screw adjustment to vary the gap between male and female surfaces from zero up to a few microns.

Liquid or gas passes along blind entry grooves in the surface of the plug and leaves by similar parallel grooves. Passage from one set of grooves to the other is via the interface gap, which forms the filtration gap. Particles filtered out are retained in the grooves.

The filter, manufactured by I. V. Pressure Controllers Ltd., Feltham, Middx., is designed for straight-through connexion in a standard pipe, and is equally effective for flow in either direction. By unscrewing the housing and sliding it along one pipe, the filter is opened for cleaning without breaking the joint. Standard filtration ranges are 0-5, 5-15 and 15-25 microns.

Publications

The Hycar Story

A new publication from British Geon Ltd. shows how Hycar butadiene/acrylonitrile rubbers are making contributions in many different fields.

After an introductory section describing the manufacture and processing of this nitrile rubber, the booklet goes on to show how its special properties meet the needs of nine different industries. In engineering, for example, the oil resistance and good mechanical properties of Hycar are relied upon in many applications involving contact between oil and rubber. In the transport industry it is used for collapsible containers, brake linings, grommets and other mechanical parts. Non-woven fabrics are bonded with Hycar latex, while Hycar-based leather finishes give greater durability and improved appearance to almost every type of leather. Aviation, printing, footwear, paper manufacture and the adhesives industry are other fields in which this rubber is used.

Duraglas Booklets

Two new sample and specification booklets for 'Duraglas' glass-fibre reinforcements, are now available from Turner Brothers Asbestos Co. Ltd., Rochdale. One folder is for the standard range of woven glass roving and the other for standard glass cloth.

Both booklets contain information about roll widths and lengths, type of dressings available, special fabrics, and the technical service which is provided. A list is also included giving the standard construction, nominal thickness, weight per sq. yd., type of weave and DTD specification designation.

The booklets, very well presented, contain actual samples of the material, each sample being held in a card frame which can be removed from the book for inspection. In addition to the basic materials in the standard range, over 200 special types are available for specific purposes.

Synthetic Rubber Prices

Prices of synthetic rubbers appear regularly in RUBBER JOURNAL AND INTERNATIONAL PLASTICS *in the first week of each month. It will be appreciated if suppliers will give notification of any price changes or additions to their range. C/f duty paid quotations are subject to slight variation due to exchange, ocean freight and insurance fluctuations. Prices are in pence per lb., except where otherwise stated. Grades are expressed as follows:* 1001/2/6 = *grades* 1001, 1002 *and* 1006.

(e-qdp)—Ex-quay duty paid (cifUKdp)—cif UK duty paid (e-i)—Ex-installation (ddp)—Delivered duty paid (e-sUK)—Ex-store UK (ex-wUK)—Ex-warehouse UK (d)—Delivered BM—black masterbatch CBM—cold, black masterbatch CNP—cold, non-pigmented CNS—cold, non-staining COE—cold, oil extended COELC—cold, oil extended, light coloured CO/BM—cold, oil/black masterbatch CPOE—cold, pigmented, oil extended CRE—cold, rosin extended dw—Dry weight HN—high nitrile HNP—high nitrile, powder HP—hot, pigmented HS—high styrene HMW—high mol. wt. LMW—low mol. wt. MHN—medium high nitrile MLN—medium low nitrile MMW—medium molecular weight MN—medium nitrile NS—non-staining TS—total solids RTV—room temp. vulc.

SBR TYPES AND HIGH-STYRENE RUBBER

Ameripol (Goodrich Gulf) (e-qdp)
(min., 70,000-lb. lots)

1000/1	Hot, Non-Oil	23.1
1002/6/7	,, ,,	23.34
1009/11	,, ,,	23.71
1012	,, ,,	23.24
1013	,, ,,	23.94
1500/1/2	Cold, Non-Oil	23.1
1703	COE, 25% Oil	*20.31
1705	,, ,,	*20.07
1707/8	,, 37.5% Oil	*18.89
1710/12	,, ,,	*18.66

*Under 70,000 lb., min. 600 lb.

ASRC (American Synthetic Rubber Corpn.) (cifUKdp*)
(carloads lots of 30,000 lb.)

1000/1/4/6	Hot, Non-Oil	23.99
1009	,, ,,	24.61
1018	,, ,,	26.74
1019	,, ,,	26.26
1500/2	Cold, Non-Oil	23.99
1503	,, ,,	26.02
3110	,, ,,	25.78
1703	COE	20.69
1708	,,	19.27

*US/£ conversion rate $2.80

Cariflex (Shell Chemical) (e-sUK)

S-1000	Hot	22.25
S-1002	,,	23.375
S-1006	,,	22.25
S-1009/11/13	,,	24.0
S-1500/2/9	Cold	22.25
S-1600/2	CBM	19.625
S-1605	,,	19.375
S-1606	,,	18.75
S-7652	,,	20.0
S-1703	COE	19.25
S-1707	,,	18.0
S-1709/12	,,	17.75
S-1803	COBM	17.875
S-1806	,,	16.625
S-1807	,,	17.375
S-1808	,,	16.25

FR-S (Firestone) (delUK*)

1000/1/4/6/7 and 195	Hot	22.50
1500/2 and 146	Cold	22.50
1703 and 173	OE	19.11
1710/12 and 184	,,	18.00
178	,,	18.25
201	,,	16.71
1009	UK Specialty	23.06
1012 ,,	,,	22.59
1013 ,,	,,	23.59
1014 ,,	,,	26.18
181 ,,	,,	22.50
182 ,,	,,	23.29
147 ,,	,,	20.94
158 ,,	,,	28.00
158-S		27.50

*Import Duty not included

Int. Synthetic Rubber (d)

Intol 1500/2	22.5
Intol 1509	22.5
Intol 1570	23.5
Intol 1006	22.5
Intol 1710	18.0
Intol 1712	18.0
Intol 1778	18.25

Naugapol (Naugatuck Chemical) (e-sUK)

1016	28.0
1018	28.5
1019	28.0
1022	30.75
1023	32.75
1503	27.75
1504	34.0
6101	26.25
6102	27.75
K-45	30.5
K-50	31.25
KO-50	29.0

ANIC (cif UK dp)

1500	22.25
1502	22.25
1708	18.00
1712	17.75

Philprene (Phillips) (e-qdp*)

1000/1/6	Hot, Non-Pig	23.28
1009	,, ,,	24.69
1010	,, ,,	25.86
1018	,, ,,	26.80
1019	,, ,,	26.33
1100	HP	19.65
1104	,,	19.28
1500/2	CNP	23.28
1503	,,	26.1
1601	CP	19.56
1605	,,	19.28
1703	COE	20.23
1706	,,	19.94
1708	,,	18.82
1712	,,	18.58
1803	CPOE	17.78
1805	,,	15.99

*US/£ conversion rate $2.81½

Plioflex (Goodyear) (ex-wUK)

1006	HNP	22.25
1500/2/7/8	CNP	22.25
1006	S	22.75
1703	COE	19.25
1710/12	,,	17.75
1773	COELC	19.25
1778	,,	18.0
B—6		27.5
B—5		28.0

Polysar (Polymer UK) (e-sUK)

S Hot	22.25
S-630 Hot	22.25
Kryflex 200 Cold	23.5
Krylene	22.25
Krylene NS	22.25
Krylene 602 Cold	22.25
Krynol 651 COE	17.75
Krynol 652 ,,	18.0
S-X 371 Process Aid	24.0

Synpol (Texas-US Chemical) (e-qdp)

1000/1	Hot	22.25
1002	,,	22.47
1006/7	,,	22.25
1009	,,	22.81
1012	,,	22.38
1013/61	,,	22.25
X274	,,	23.45
8000	,,	22.25
1500/02/51	Cold	22.25
1703	COE	19.25
1707/8	,,	18.0
1711	,,	17.88
1712	,,	17.75
8200	,,	18.0
8201	,,	16.6
8202	,,	16.38
8152	CBM	18.6
8151	COBM	18.2
8253	,,	15.84
8254	,,	15.45
8255	,,	14.8
8267	,,	16.4

(Masterbatch prices US cents per lb. fas Gulf ports)

SBR LATICES

Copo (Copolymer) (cifUKdp)
(10-ton lots)

2101	(dw)	46.3
X-765	,,	40.8
X-800	,,	37.2
2102/5	,,	38.0

Pliolite Rubber (Goodyear) (d)

2000	40

Latex (dw)

2001/4/5/8	40
5350	40

Pliolite Resin (Goodyear) (d)

101A	(dw)	44
150	,,	50
151	,,	35
160	,,	50
170	,,	50

Hycar (B. F. Goodrich) (ddp)

2507 (HS) dw	48

Polysar (Polymer UK) (e-sUK)

Latex, type IV	32.5 TS
Latex, type 722	31.75 TS
(Non-returnable 45-gallon drums)	(e-i)
Latex, type 722 (bulk quantities)	28.75 TS

Int. Synthetic Rubber (ex-wks)

Intol Latex M23B/R23/F28	22.25
Intol Latex 62A	27.0

Dylex (Koppers Int. CA) (fas)

K-42A/52/51/900	31.6

ACRYLONITRILE TYPES

Butaprene N (Firestone) (cifUKdp)

NL	52.5
NAA	56.25
NF	51.5
NXM	60.18

Chemigum (e-s)

N—1	75
N—3A	52
N—5	52
N—6G/7/8/600X	45

Hycar (British Geon) (UKd)
(500-lb. lots and over)

1001	High Nitrile Hot	52
1041	,, ,, Cold	52
1002	MHN Hot	45
1042	,, Cold	45

Hycar (B. F. Goodrich) (ddp)
(500-lb. lots and over)

1411	HNP	66
1432	MHN (crumb)	64
1072	,, (carboxyl)	66
1312	,, (liquid)	55
1043	MLN	51
1014	Low Nitrile	61

I.C.I. (min., 5-cwt. lots) (UKd)

Butakon A-4051 HN Cold	52
Butakon A-3051 MN Cold	45
Butakon A-3002 ,, ,,	45

Paracril (US Rubber) (dwe-sUK)

18-80	Low Nitrile	61
AJ	,, ,,	50
B	MLN	51
BJ	,,	51
BLT	,, Cold	51
BJLT	,, ,,	51
C	MHN	59
CLT	,, Cold	59
CV	,, (crumb)	63
D	High Nitrile	67
ALT		51
OZO		47

Polysar (Polymer UK) (d)

Krynac 800 MN	45
Krynac 802 LN	45
Krynac 803 MN (low Mooney)	45
Krynac 801 HN	52
Krynac 804 (MN-cross linked)	45

ACRYLONITRILE LATICES

Butaprene N (Firestone) (cifUKdp)

N-300 (dw)	53
N-400 ,,	60.5

Chemigum Latex (Goodyear) (d)

200	(dw)	65
235/6	CHS ,,	60
245	B ,,	52
245/6/7/8	CHS ,,	52

Hycar (B.F. Goodrich) (ddp)
(dry weight, drum lots)

1551 High Nitrile	66
1552 MHN	57

Hycar (British Geon) (UKd)
(dry weight, 3 drums and over)

1561	High Nitrile	60
1571	,, ,, (carboxyl)	60
1562	MHN	52
1577	,, (modified)	52

ACRYLIC TYPES

Hycar (B. F. Goodrich) (ddp)

4021 Slab, 500 lb. and over	144
4501 Latex, dry weight	96

BUTYL TYPES

Esso (e-sUK)

Regular 035/150/215	21.75
Regular 217/8	21.75
Regular 325	21.75
Non-staining 165	22.75
Non-staining 268	22.75
Non-staining 365	22.75

Vistanex (Polyisobutylene) (e-qdp)

MS	LMW	54
MH	,,	54
L-80	MMW	54
L-100	,,	54
L-120	,,	54
L-140	,,	54

Polysar (Polymer UK) (e-sUK)

Butyl 100/200/300		21.75
Butyl 301/400	NS	21.75
Butyl 101	NS	26.25
Butyl 402	NS	22.5

Hycar (B. F. Goodrich) (ddp)
(500 lb. and over)

2202 Brominated	68

NEOPRENES

		(ddp)
W	(dwdel)	42.62
WHV	,,	38.5
WRT	,,	48.37
WX/GN/GNA	,,	44.62
GRT and S	,,	45.62
AC	,,	57.125
KNR	,,	75.62
AC 'M' and 'S'	,,	57.125
CG/AD	,,	57.125

Latices—Dry
(per lb. del, min., 50 lb.)

571	49.75
842A	49.75
572	51.25
601A	51.87
650	54.125
735	51.25
736	51.25
950	58.25
60	51.87
750	51.25
635	53.62

SILICONE RUBBERS

Midland Silicones
(500-lb. lots del)

Stocks	16s. 6d. to 35s.
Pastes	26s. to 35s.
Gums and base stock	36s. to 42s.
Cold-curing silicone rubber	20s. and 23d. 6d.

I.C.I. Silicones

Gums (40-lb. lots del)	39s. 6d.-47s.
Stocks (250-lb. lots del)	22s.-35s.
Pastes (1000-lb. lots del)	27s.6d.-35s.9d.
Silcoset (RTV) (250-lb. lots del)	21s. to 24s.

REINFORCING RESINS AND RUBBERS

I.C.I. (min., 2-ton lots) (UKd)

Butakon S-8551	36.5
Butakon S-7001	33.5

Hycar (B.F. Goodrich) (ddp)

2007 (powder)	42.5

Pliolite (Goodyear) (d)

S—6B	36.5

Polysar (Polymer UK) (e-sUK)

SS-250 HS (bale)	27.25
SS-250 ,, (flake)	27.5
Kryflex 252 HS	25.5
Kryflex 202 (HMW Cold polymerized)	25.75

Cariflex (Shell) (e-sUK)

SP-103	28.0

Cyclite (Durham Raw Materials) 42

HYPALON (ddp)

20	48
30	60.25
40	50.75

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Filtration normally depends on the use of permeable media which are selected according to the size of particle to be filtered out. Now a filter has been designed in which the minimum size of particle which will be retained is determined by purely mechanical means, and set up on a calibrated control.

A precision conical male plug fits within a corresponding female housing, and can be moved axially a short distance by a screw adjustment to vary the gap between male and female surfaces from zero up to a few microns.

Liquid or gas passes along blind entry grooves in the surface of the plug and leaves by similar parallel grooves. Passage from one set of grooves to the other is via the interface gap, which forms the filtration gap. Particles filtered out are retained in the grooves.

The filter, manufactured by I. V. Pressure Controllers Ltd., Feltham, Middx., is designed for straight-through connexion in a standard pipe, and is equally effective for flow in either direction. By unscrewing the housing and sliding it along one pipe, the filter is opened for cleaning without breaking the joint. Standard filtration ranges are 0-5, 5-15 and 15-25 microns.

Publications

The Hycar Story

A new publication from British Geon Ltd. shows how Hycar butadiene/acrylonitrile rubbers are making contributions in many different fields.

After an introductory section describing the manufacture and processing of this nitrile rubber, the booklet goes on to show how its special properties meet the needs of nine different industries. In engineering, for example, the oil resistance and good mechanical properties of Hycar are relied upon in many applications involving contact between oil and rubber. In the transport industry it is used for collapsible containers, brake linings, grommets and other mechanical parts. Non-woven fabrics are bonded with Hycar latex, while Hycar-based leather finishes give greater durability and improved appearance to almost every type of leather. Aviation, printing, footwear, paper manufacture and the adhesives industry are other fields in which this rubber is used.

Duraglas Booklets

Two new sample and specification booklets for 'Duraglas' glass-fibre reinforcements, are now available from Turner Brothers Asbestos Co. Ltd., Rochdale. One folder is for the standard range of woven glass roving and the other for standard glass cloth.

Both booklets contain information about roll widths and lengths, type of dressings available, special fabrics, and the technical service which is provided. A list is also included giving the standard construction, nominal thickness, weight per sq. yd., type of weave and DTD specification designation.

The booklets, very well presented, contain actual samples of the material, each sample being held in a card frame which can be removed from the book for inspection. In addition to the basic materials in the standard range, over 200 special types are available for specific purposes.

Synthetic Rubber Prices

Prices of synthetic rubbers appear regularly in RUBBER JOURNAL AND INTERNATIONAL PLASTICS *in the first week of each month. It will be appreciated if suppliers will give notification of any price changes or additions to their range. C/f duty paid quotations are subject to slight variation due to exchange, ocean freight and insurance fluctuations. Prices are in pence per lb., except where otherwise stated. Grades are expressed as follows:* 1001/2/6 = *grades* 1001, 1002 *and* 1006.

(e-qdp)—Ex-quay duty paid (cif UK dp)—cif UK duty paid (e-i)—Ex-installation (ddp)—Delivered duty paid (e-sUK)—Ex-store UK (ex-wUK)—Ex-warehouse UK (d)—Delivered BM—black masterbatch CBM—cold, black masterbatch CNP—cold, non-pigmented CNS—cold, non-staining COE—cold, oil extended COELC—cold, oil extended, light coloured CO/BM—cold, oil/black masterbatch CPOE—cold, pigmented, oil extended CRE—cold, rosin extended dw—Dry weight HN—high nitrile HNP—high nitrile, powder HP—hot, pigmented HS—high styrene HMW—high mol. wt. LMW—low mol. wt. MHN—medium high nitrile MLN—medium low nitrile MMW—medium molecular weight MN—medium nitrile NS—non-staining TS—total solids RTV—room temp. vulc.

SBR TYPES AND HIGH-STYRENE RUBBER

Ameripol (Goodrich Gulf) (e-qdp)
(min., 70,000-lb. lots)

1000/1	Hot, Non-Oil	23.1
1002/6/7	,, ,,	23.34
1009/11	,, ,,	23.71
1012	,, ,,	23.24
1013	,, ,,	23.94
1500/1/2	Cold, Non-Oil	23.1
1703	COE, 25% Oil	*20.31
1705	,, ,, ,,	*20.07
1707/8	,, 37.5% Oil	*18.89
1710/12	,, ,, ,,	*18.66

*Under 70,000 lb., min. 600 lb.

ASRC (American Synthetic Rubber Corpn.) (cif UK dp*)
(carloads lots of 30,000 lb.)

1000/1/4/6	Hot, Non-Oil	23.99
1009	,, ,,	24.61
1018	,, ,,	26.74
1019	,, ,,	26.26
1500/2	Cold, Non-Oil	23.99
1503	,, ,,	26.02
3110	,, ,,	25.78
1703	COE ,,	20.69
1708	,,	19.27

*US/£ conversion rate $2.80

Cariflex (Shell Chemical) (e-sUK)

S-1000	Hot	22.25
S-1002	,,	23.375
S-1006	,,	22.25
S-1009/11/13	,,	24.0
S-1500/2/9	Cold	22.25
S-1600/2	CBM	19.625
S-1605	,,	19.375
S-1606	,,	18.75
S-7652	,,	20.0
S-1703	COE	19.25
S-1707	,,	18.0
S-1709/12	,,	17.75
S-1803	COBM	17.875
S-1806	,,	16.625
S-1807	,,	17.375
S-1808	,,	16.25

FR-S (Firestone) (del UK*)

1000/1/4/6/7 and 195	Hot	22.50
1500/2 and 146	Cold	22.50
1703 and 173	OE	19.11
1710/12 and 184	,,	18.00
178	,,	18.25
201	,,	16.71
1009	UK Specialty	23.06
1012	,, ,,	22.59
1013	,, ,,	23.59
1014	,, ,,	26.18
181	,, ,,	22.50
182	,, ,,	23.29
147	,, ,,	20.94
158	,, ,,	28.00
158-S		27.50

*Import Duty not included

Int. Synthetic Rubber (d)

Intol 1500/2	22.5
Intol 1509	22.5
Intol 1570	23.5
Intol 1006	22.5
Intol 1710	18.0
Intol 1712	18.0
Intol 1778	18.25

Naugapol (Naugatuck Chemical) (e-sUK)

1016	28.0
1018	28.5
1019	28.0
1022	30.75
1023	32.75
1503	27.75
1504	34.0
6101	26.25
6102	27.75
K-45	30.5
K-50	31.25
KO-50	29.0

ANIC (cif UK dp)

1500	22.25
1502	22.25
1708	18.00
1712	17.75

Philprene (Phillips) (e-qdp*)

1000/1/6	Hot, Non-Pig	23.28
1009	,, ,,	24.69
1010	,, ,,	25.86
1018	,, ,,	26.80
1019	,, ,,	26.33
1100	HP	19.65
1104	,,	19.28
1500/2	CNP	23.28
1503	,,	26.1
1601	CP	19.56
1605	,,	19.28
1703	COE	20.23
1706	,,	19.94
1708	,,	18.82
1712	,,	18.58
1803	CPOE	17.78
1805	,,	15.99

*US/£ conversion rate $2.81½

Plioflex (Goodyear) (ex-wUK)

1006	HNP	22.25
1500/2/7/8	CNP	22.25
1006	S	22.75
1703	COE	19.25
1710/12	,,	17.75
1773	COELC	19.25
1778	,,	18.0
B—6		27.5
B—5		28.0

Polysar (Polymer UK) (e-sUK)

S Hot	22.25
S-630 Hot	22.25
Kryflex 200 Cold	23.5
Krylene	22.25
Krylene NS	22.25
Krylene 602 Cold	22.25
Krynol 651 COE	17.75
Krynol 652 ,,	18.0
S-X 371 Process Aid	24.0

Synpol (Texas-US Chemical) (e-qdp)

1000/1	Hot	22.25
1002	,,	22.47
1006/7	,,	22.25
1009	,,	22.81
1012	,,	22.38
1013/61	,,	22.25
X274	,,	23.45
8000	,,	22.25
1500/02/51	Cold	22.25
1703	COE	19.25
1707/8	,,	18.0
1711	,,	17.88
1712	,,	17.75
8200	,,	18.0
8201	,,	16.6
8202	,,	16.38
8152	CBM	18.6
8151	COBM	18.2
8253	,,	15.84
8254	,,	15.45
8255	,,	14.8
8267	,,	16.4

(Masterbatch prices US cents per lb. fas Gulf ports)

SBR LATICES

Copo (Copolymer) (cif UK dp)
(10-ton lots)

2101	(dw)	46.3
X-765	,,	40.8
X-800	,,	37.2
2102/5	,,	38.0

Pliolite Rubber (Goodyear) (d)

2000	40

Latex (dw)

2001/4/5/8	40
5350	40

Pliolite Resin (Goodyear) (d)

101A	(dw)	44
150	,,	50
151	,,	35
160	,,	50
170	,,	50

Hycar (B. F. Goodrich) (ddp)

2507 (HS) dw	48

Polysar (Polymer UK) (e-sUK)

Latex, type IV	32.5 TS
Latex, type 722	31.75 TS
(Non-returnable 45-gallon drums)	(e-i)
Latex, type 722 (bulk quantities)	28.75 TS

Int. Synthetic Rubber (ex-wks)

Intol Latex M23B/R23/F28	22.25
Intol Latex 62A	27.0

Dylex (Koppers Int. CA) (fas)

K-42A/52/31/900	31.6

ACRYLONITRILE TYPES

Butaprene N (Firestone) (cif UK dp)

NL	52.5
NAA	56.25
NF	51.5
NXM	60.18

Chemigum (e-s)

N—1	75
N—3A	52
N—5	52
N—6G/7/8/600X	45

Hycar (British Geon) (UKd)
(500-lb. lots and over)

1001	High Nitrile Hot	52
1041	,, ,, Cold	52
1002	MHN Hot	45
1042	,, Cold	45

Hycar (B. F. Goodrich) (ddp)
(500-lb. lots and over)

1411	HNP	66
1432	MHN (crumb)	64
1072	,, (carboxyl)	66
1312	,, (liquid)	55
1043	MLN	51
1014	Low Nitrile	61

I.C.I. (min., 5-cwt. lots) (UKd)

Butakon A-4051 HN Cold	52
Butakon A-3051 MN Cold	45
Butakon A-3002 ,, ,,	45

Paracril (US Rubber) (dwe-sUK)

18-80	Low Nitrile	61
AJ	,,	50
B	MLN	51
BJ	,,	51
BLT	,, Cold	51
BJLT	,, ,,	51
C	MHN	59
CLT	,, Cold	59
CV	,, (crumb)	63
D	High Nitrile	67
ALT		51
OZO		47

Polysar (Polymer UK) (d)

Krynac 800 MN	45
Krynac 802 LN	45
Krynac 803 MN (low Mooney)	45
Krynac 801 HN	52
Krynac 804 (MN-cross linked)	45

ACRYLONITRILE LATICES

Butaprene N (Firestone) (cif UK dp)

N-300 (dw)	53
N-400 ,,	60.5

Chemigum Latex (Goodyear) (d)

200		(dw)	65
235/6	CHS	,,	60
245	B	,,	52
245/6/7/8	CHS	,,	52

Hycar (B.F. Goodrich) (ddp)
(dry weight, drum lots)

1551 High Nitrile	66
1552 MHN	57

Hycar (British Geon) (UKd)
(dry weight, 3 drums and over)

1561	High Nitrile	60
1571	,, ,, (carboxyl)	60
1562	MHN	52
1577	,, (modified)	52

ACRYLIC TYPES

Hycar (B. F. Goodrich) (ddp)

4021	Slab, 500 lb. and over	144
4501	Latex, dry weight	96

BUTYL TYPES

Esso (e-sUK)

Regular 035/150/215	21.75
Regular 217/8	21.75
Regular 325	21.75
Non-staining 165	22.75
Non-staining 268	22.75
Non-staining 365	22.75

Vistanex (Polyisobutylene) (e-qdp)

MS	LMW	54
MH	,,	54
L-80	MMW	54
L-100	,,	54
L-120	,,	54
L-140	,,	54

Polysar (Polymer UK) (e-sUK)

Butyl 100/200/300		21.75
Butyl 301/400	NS	21.75
Butyl 101	NS	26.25
Butyl 402	NS	22.5

Hycar (B. F. Goodrich) (ddp)
(500 lb. and over)

2202 Brominated	68

NEOPRENES

		(ddp)
W	(dwdel)	42.62
WHV	,,	38.5
WRT	,,	48.37
WX/GN/GNA	,,	44.62
GRT and S	,,	45.62
AC	,,	57.125
KNR	,,	75.62
AC 'M' and 'S'	,,	57.125
CG/AD	,,	57.125

Latices—Dry
(per lb. del, min., 50 lb.)

571	49.75
842A	49.75
572	51.25
601A	51.87
650	54.125
735	51.25
736	51.25
950	58.25
60	51.87
750	51.25
635	53.62

SILICONE RUBBERS

Midland Silicones
(500-lb. lots del)

Stocks	16s. 6d. to 35s.
Pastes	26s. to 35s.
Gums and base stock	36s. to 42s.
Cold-curing silicone rubber	20s. and 23d. 6d.

I.C.I. Silicones

Gums (40-lb. lots del)	39s. 6d.-47s.
Stocks (250-lb. lots del)	22s.-35s.
Pastes (1000-lb. lots del)	27s.6d.-35s.9d.
Silcoset (RTV) (250-lb. lots del)	21s. to 24s.

REINFORCING RESINS AND RUBBERS

I.C.I. (min., 2-ton lots) (UKd)

Butakon S-8551	36.5
Butakon S-7001	33.5

Hycar (B.F. Goodrich) (ddp)

2007 (powder)	42.5

Pliolite (Goodyear) (d)

S—6B	36.5

Polysar (Polymer UK) (e-sUK)

SS-250 HS (bale)	27.25
SS-250 ,, (flake)	27.5
Kryflex 252 HS	25.5
Kryflex 202 (HMW Cold polymerized)	25.75

Cariflex (Shell) (e-sUK)

SP-103	28.0

Cyclite (Durham Raw Materials) 42

HYPALON

	(ddp)
20	48
30	60.25
40	50.75

TRADE MARKS

Objections to the registration of any of the undermentioned applications may be lodged with the Comptroller-General of Patents, Designs and Trade Marks at the Patent Office, 25 Southampton Buildings, Chancery Lane, London, W.C.2, within one month of the date mentioned. The objections must be stated on Trade Marks Form No. 7, cost £2, obtainable through any money order office. The extracts—from 'The Trade Marks Journal'—given below are reproduced by permission of the Controller of H.M. Stationery Office.

VELOMAC (805,113) Covers included in Class 22 made of heat-sealable plastics. Quinns Bargains Ltd., 27 Markhouse Road, London, E.17 (Class 22; October 5 1960.)

DARLSPAN (805,892) Fabrics (being textile piece goods) containing elastic yarns and/or threads composed wholly or in part of synthetic elastomers. Darlington Fabrics Corp., 350 Fifth Avenue, New York. Address for service is c/o Cruikshank and Fairweather, 29 Southampton Buildings, Chancery Lane, London, W.C.2. (Class 24; October 5 1960.)

BRITACELLA (B782,809) Chemical products for use in industry, science and photography, thermoplastics in the form of powders and granulates; and straw pulp; but not including glue or any goods of the same description as glue. Carl Schwarz, Heinz Burgtorf, Otto Benecke, Egon Schwarz and Johann Heinrich Benecke, trading as J. H. Benecke, 40 Benecke-Allee, Hannover-Vinnhorst, Germany. Address for service is c/o Potts and Co., 15 Hamilton Square, Birkenhead. (Class 1; October 12 1960.)

NUFLEX (784,433) Machine belting impregnated with rubber. The Mulcott Belting Co. Ltd., Dudley Hill, Bradford, 4, Yorkshire. (Class 7; October 12 1960.)

CONTIMAC (799,234) Wrapping and packaging materials made of paper, cardboard, laminations of polythene film or of regenerated cellulose film. Hamac A.G., Bahnhofstrasse 5, Zug, Switzerland. Address for service is c/o A. A. Thornton and Co., Northumberland House, 303-306, High Holborn, London, W.C.1. (Class 16; October 12 1960).

SILCOFOAM (801,628) Chemical products for use as industrial foaming agents. Imperial Chemical Industries Ltd., Imperial Chemical House, Millbank, London, S.W.1. (Class 1; October 12 1960.)

(B800,898) Machines and parts and fittings therefor, all included in Class 7; machine tools; and machine belting and machine couplings; all made wholly or substantially wholly of nylon. Société Rhodiaceta, 21 Rue Jean-Goujon, Paris 8e. Address for service is c/o W. Symmons and Co., 329 High Holborn, London, W.C.1. To be associated with No. B800,900 (4285, 1254) and another. (Class 7; October 12 1960.)

VACALEX (802,059) Materials in sheet form made of thermoplastics included in Class 17, for shaping by vacuum-forming. M. L. Shelley and Partners Ltd., 213-215 Upper Street, Islington, London, N.1. (Class 17; October 12 1960.)

SILVERCELL (805,072) All goods included in Class 17. BTR Industries Ltd., Herga House, Vincent Square, London, S.W.1. (Class 17; October 12 1960.)

TROPAMA (800,388) Pipes and tubes, all made of cement, concrete or of plastics and being for use in building construction as drainage and ventilation members for masonry and the like. Kurt Vogler and Rudi Uhlig, trading as Kurt Vogler and Co., Ohg, Schönauer Strasse 74, Lindau/Bodensee, Germany. Address for service is c/o J. A. Kemp and Co., 14 South Square, Gray's Inn, London, W.C.1. (Class 19; October 12 1960.)

NEW COMPANIES

Portaplas Ltd. (672,870).—October 19. Capital: £2,000 in £1 shares. To carry on the business of workers in glass fibre, plastics, reinforced plastics, glass, china, etc. The first directors are: Ronald G. Uden, 31 Dysart Avenue, Cosham, Portsmouth; Brian E. James, 59 Copnor Road, Copnor, Portsmouth; Roy A. Patching and Edward Z. Elliott. Regd. office: 26/8 Spring Street, Portsmouth, Hants.

Kenney Plastics Co. Ltd. (672,982).—October 20. Capital: £1,000 in £1 shares. To carry on the business of plastic, general electrical and precision engineers, etc. The first directors are: Robert N. Kenney, 6 Fairbourne Road, Braunstone, Leicester; Barbara M. Leake, 109 Beaconsfield Road, Leicester. Regd. office: 22 Park Road, Ratby, Leics.

W. Weatherburn & Son Ltd. (672,940).—October 19. Capital: £900 in £1 shares. To carry on the business of manufacturers of and dealers in footwear, leather and rubber goods, etc. The permanent directors are: Walter Weatherburn and Alice J. Weatherburn. Regd. office: 17 Goodmayes Road, Goodmayes, Essex.

Increases of Capital

William J. Cox (Sales) Ltd. (619,433).—Plastics, etc., 559 Holloway Road, N.19. Increased on February 10 1960 by £35,000 in 15,000 ordinary and 20,000 8 per cent. preference shares of £1 each beyond the registered capital of £15,000.

British Industrial Plastics Ltd. (81,434).—Haymarket House, 28 Haymarket, S.W. Increased on March 10 1960 by £2,500,000 in 2s. ordinary shares, beyond the registered capital of £1,500,000.

Tyres Southampton (1957) Ltd. (594,124).—7 Brunswick Place, Southampton. Increased on March 14 1960 by £8,115 in 1,115 ordinary and 7,000 non-voting 8 per cent. redeemable preference shares of £1 each, beyond the registered capital of £100.

R·J·I·P·

CLASSIFIED ADVERTISEMENTS

APPOINTMENTS VACANT

6d. a word, Minimum 10/- Box 2/-

FOREMAN wanted to take complete charge of rubber moulding shop. Desired experience includes operating piece work system. Bonding experience also an asset. Applicant should indicate remuneration required.—Howard Clayton-Wright Ltd., Wellesbourne, Warwick. (614)

ARTICLES FOR SALE

MICROCELLULAR and RESIN RUBBER CRUMB

All shades, standard mesh sizes for IMMEDIATE or FORWARD delivery. For samples and prices, please write: RUSHDEN GRANULATING CO. LTD., 147 High Street, Rushden, Northants. Phone Rushden 2153

(629)

TECHNICAL COURSES

NATIONAL COLLEGE OF RUBBER TECHNOLOGY
Holloway Road, London, N.7.

PLASTICS COURSES

(1) A course in BASIC PLASTICS TECHNOLOGY consisting of ten afternoon sessions of practical work supplemented by lectures, for those who wish to gain a basic knowledge of the processing of plastics.

Wednesday afternoons 2—5 p.m. January 18th to March 22nd, 1961.

Fee: £2 5s. plus £2 deposit against breakages.

(2) PVC TECHNOLOGY—Mr. J. A. Rhys, M.Sc., A.K.C. A comprehensive course of eleven lectures on PVC polymers, compounding ingredients and applications, will be held on Monday at 6 p.m. from January 9th to March 20th, 1961.

Fee: £2 3s.

Application to join either of these courses should be made to the Head of the College.

(622)

APPOINTMENTS VACANT

Plastics Product Engineer

NORTH BRITISH RUBBER

affiliated to

U.S. RUBBER OF AMERICA

require the services of a Product Engineer with the ability to develop Thermoplastic applications, which is becoming a major factor in the expansion of our activity in the plastics industry. Recognising this, we propose appointing a young Engineer who has had experience in product design and application of plastics in the consumer industry. Vacuum forming experience would be an advantage but a flair for developing ideas and selling them to our customers is essential. The work would be varied and interesting and an excellent salary would be paid to selected applicant.

The Company operates a five-day week and provides a contributory Superannuation Scheme, free Life Assurance and assistance with removal expenses.

Applications marked PE giving full details of age, experience and present salary should be addressed to Industrial Relations Division, The North British Rubber Co., Castle Mills, Edinburgh, 3. (624)

RUBBER technologist/chemist. Young man with some experience (preferably of proofing) and at least of L.I.R.I. standard.—Apply Chief Chemist, Greengate Works, Greengate and Irwell Rubber Co. Ltd., P.O. Box No. 62, Manchester, 3. (625)

ARTICLES FOR SALE (SECONDHAND)

6d. a word, Minimum 12/6 Box 2/-

FOR SALE. Approximately 20 tons synthetic latex.—Samples and further details Box 612. (612)

NEW structional steelwork and galvanised steel windows, not yet erected, for a brick and steel building, 165ft. x 40ft. floor area 8,280 square feet. 15ft. high to eaves, one bay, 2 upper floors. Building not now required. Available immediately at below cost.—Enquiries to Box 620. (620)

UNICEL 'S.' About 5,000lbs. Conforms to recognised standard. Offer invited.—Box 628. (628)

BUSINESS OPPORTUNITIES

Well-known overseas Latex Manufacturer is interested in the manufacture of extruded latex thread, requires plant and/or technical information and would also be interested in a tie-up witth existing latex thread manufacture.

Reply Box — 630

(630)

CLASSIFIED ADVERTISEMENT FORM

Please keep for future use if not required immediately

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31	32	33	34	35

APPOINTMENTS WANTED 10s. MINIMUM · OTHER HEADINGS 12s. 6d. MINIMUM · .....words @ 6d. per word

BOX No. 2/- EXTRA *Total Cost*.....

Name.....

BLOCK LETTERS PLEASE *Address*.....

.....

MACHINERY WANTED

6d. a word, Minimum 12/6 Box 2/-

RUBBER bale splitter required. Good condition.—Details to Box 623. (623)

Donald Leaver Limited

1 LONDON ROAD, STAINES, MIDDX. Phone STAINES 55271-2

150-ton 4 daylight hydraulic moulding press by Robinson. 14in. diameter ram. Fitted five drilled steel steam platens 24in. square giving four 6in. daylights. (631)

MACHINERY FOR SALE

6d. a word, Minimum 12/6 Box 2/-

'COTSWOLD' dipping machines and circulating tanks for latex and PVC. New catalogues now available on request. —Lionel Hook and Sons, Ebley, Stroud, Glos. Tel.: Stonehouse 614/5. (380R)

MANUFACTURERS of roughing machines for rubber sheeting, sponge rubber, splitting machines, leather cloth plant, embossing plates and rollers, spreading machines and presses.—G. L. Murphy Ltd., Imperial Works, Menston, Nr. Leeds. (238R)

NEW, unused treble pass medium velocity paxman 'Ultranom'c' boiler, 8ft. 6in. dia. x 12ft., arranged for H.P.H.W. process heating. Output 7,000,000 BTU's/HR at 200lbs. per sq. in. Could be easily modified for steam raising at 140lbs. per sq. in. The boiler is arranged for oil firing, but burner not included. Boiler now lying at maker's depot in Essex. Available for immediate delivery at below maker's price.—Apply Box 621. (621)

NO. 11 Banbury with 250 h.p. drive. K.4 Intermix with 110 h.p. drive. 8½-in. extruder with 120/40 h.p. variable speed drive. 8in. Camelback extruder, 4in. Camelback extruder, 3in. extruder. 9in. x 4in. 2-speed laboratory mill.—Reed Brothers (Engineering) Ltd., Replant Works, Woolwich Industrial Estate, London, S.E.18. Tel.: Woolwich 7611 (6 lines). (626)

ADVERTISERS

YOUR ANNOUNCEMENTS MAY BE DISPLAYED IN THE CLASSIFIED SECTION AT THE FOLLOWING RATES

PER INCH SINGLE COLUMN

1 INSERTION £3. 0. 0. *7 INSERTIONS* £2. 15. 0.

13 INSERTIONS OR MORE £2. 10. 0.

OR AS LINES AT 5s. 6d. PER LINE

MACHINERY FOR SALE

(continued)

RUBBER Improvement Limited, Wellingborough, Northants, require an experienced foreman for the manufacture of sponge rubber play balls utilizing the latest type of watch moulds now installed.—Replies setting out details of experience and other particulars should be addressed for the attention of the Managing Director, Rilex House, Chandos Street, London, W.1, and marked 'Private—Sports Division.' (619)

STEAM-HEATED rubber vulcanizing oven, 4ft. dia. x 6ft. long, in first-class condition.—Box 358 (358)

AGENCIES and REPRESENTATIVES

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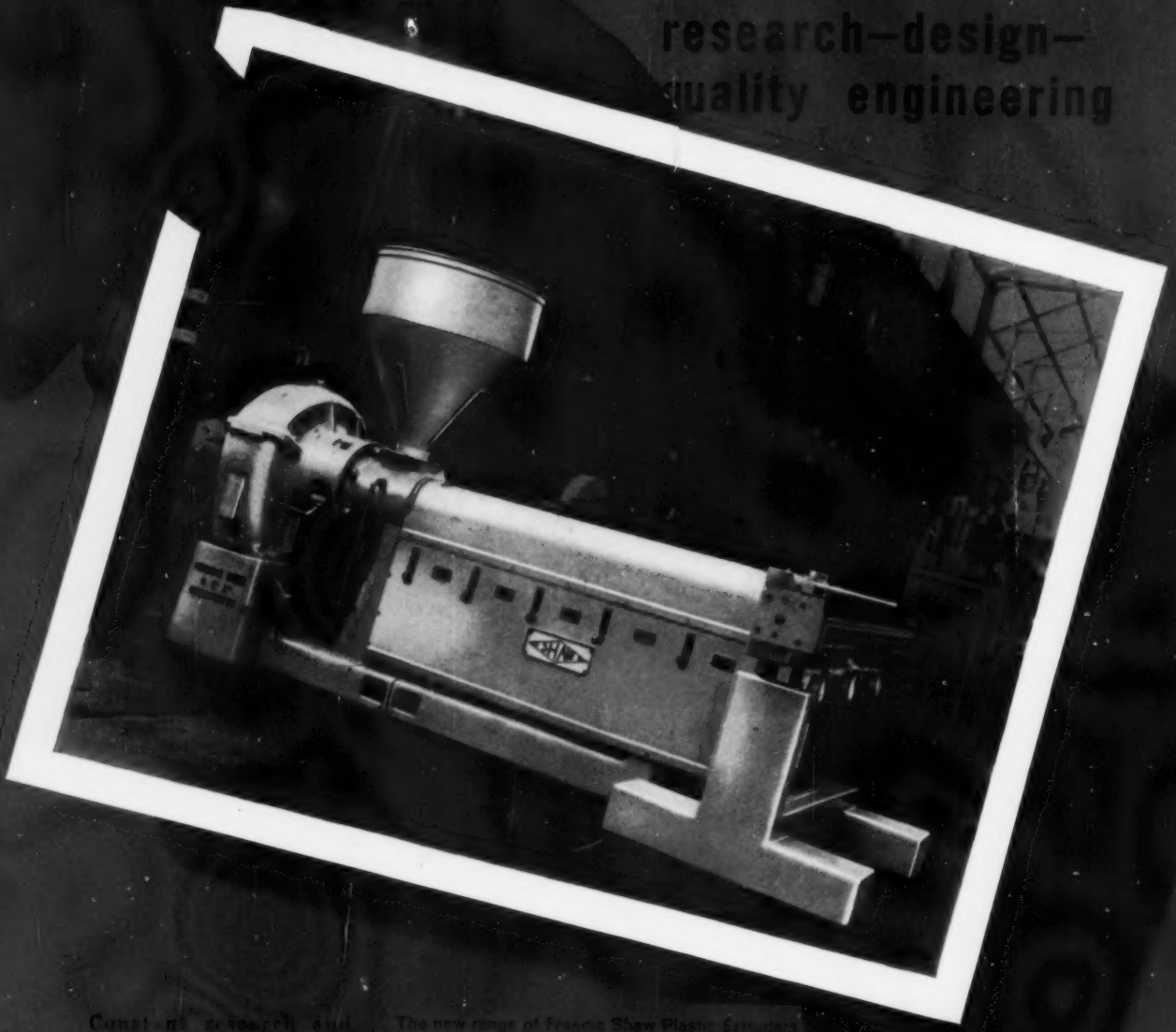

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